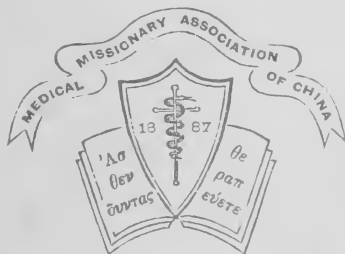


The China Medical Missionary Journal

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The China Medical Missionary Journal.

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Original Communications.

[No paper published or to be published in any other medical journal will be accepted for this department. All papers must be in the hands of the Editor on the first day of the month preceding that in which they are expected to appear. The editor cannot undertake to return manuscripts which are sent to him. A complimentary edition of a dozen reprints of his article will be furnished each contributor. Any number of reprints may be had at reasonable rates if a *written* order for the same accompany the paper.]

MALARIA AND ITS PARASITE.

(*Second Paper.*)

By N. MACLEOD, M.D.

All the forms under which the malarial parasite is seen in human blood were demonstrated at an early stage in the history of this question by Laveran. These observations were so complete that no other observer has as yet added to them. This is all the more remarkable, as his observations were made without the aid of immersion lenses or sub-stage condenser. The very multiplicity of the forms described by him doubtless at first militated against acceptance of his views. In his earlier publications he regarded the different forms as those of *one polymorphic organism*, and he still adheres to this, in opposition to the Italian and other workers in the same field, who, led by Golgi, maintain that the benign tertian and quartan fevers at least have each their own particular parasite which breeds true and possesses characteristics by which they can be distinguished from one another and from other parasites associated with what are commonly known as irregular malarial fevers, and which are often pernicious or malignant in character.

Probably the majority of workers on this subject side with Golgi, whose work on the tertian and quartan intermittent fever parasites has done more than even that of Laveran himself towards the general acceptance of the view that malarial fever is a parasitic disease. The very variety and abundance of parasitic forms met with in the surroundings in which Laveran made his great discovery have proved a great obstacle against the differentiation of malarial fever into its particular forms, each having its special parasite. The problem was simplified to observers placed differently in a neighbourhood where not several kinds of malarial fever prevailed at one time, but where these were almost or altogether confined to one or two forms. This consideration has been forced upon me by experience of malarial fever and the parasite associated

therewith originating in the neighbourhood of Shanghai, as compared with those malarial fevers and their parasites met with in patients coming to Shanghai with that malady certainly contracted elsewhere.

That kind of fever which furnishes an organism going through its cycle of development in forty-eight hours, non-pigmented in its earliest stage, soon showing a few, and when thirty-six hours' old, *many, fine* pigment granules, the parasite embedded in a red blood corpuscle which has by that time become *decoloured and swollen*, and when it sporulates breaks up into *sixteen to eighteen spores*; that form of fever is by far the most prevalent in the Shanghai neighbourhood and at all seasons. During the last three and a half years, at all events, this has been the case, so far as malarial fever occurs amongst foreigners (non-Chinese, that is). Further, while most of the cases clinically have been of well marked tertian intermittent type, a number has been quotidian, presenting two generations of the same parasite at one time in the peripheral blood at their appropriate stages of growth, one twenty-four hours older than the other. In a few cases the fever has been of continued remittent type with parasites at several different stages of growth in the same specimen.

Manson has very lately (*British Medical Journal*, March 26th, page 820) given expression to the opinion that crescents are always present in malaria. If this opinion is based on his own observations of the parasite, which, I understand, have been confined to those cases he has met with in London since he left the East, I would suggest that he is most likely to meet there with those forms of malarial fever with which crescents are associated, those being the fevers most difficult to get rid of in any country. The benign tertian and quartan fevers do not occur now in Britain, and are easily cut short with quinine wherever met with, and so are much less likely to be seen in non-malarial districts like London, where Manson has made his observations. In cases furnishing the tertian parasite above described I have never met with crescents even where the fever has been going on beyond the time at which they are generally stated to be found in a given case by most observers, viz, seven or eight days from the onset of the fever. I have watched cases of this tertian fever both in hospital and in private practice where no quinine had been taken, to determine this point, and so far have not yet found crescents. The failure to find them in these cases has not been due to want of acquaintance with these bodies, because, whilst they are perhaps more easy of detection than any other form of the parasite, I had become acquainted with them at the very commencement of my work in other fevers than the benign tertian. Their persistence in the blood at all times for a considerable period after the fever has ceased, renders their study very convenient and distinguishes their behaviour from all other forms.

One of my cases had had fever a year before in Hongkong when crescents were found by Dr. Cantlie. The fever in Shanghai was a simple tertian with several paroxysms, and recurred after four months, but at no time were crescents found either during the attacks or after they had ceased. An ayah with a history of this fever extending over many years and which furnished preparations of sporulating forms, twelve to twenty in every field, furnished at no time crescents.

The quartan fever has also occurred in Shanghai during the three-and-a-half years referred to and associated with a parasite exhibiting the characters set forth by Golgi and summed up shortly thus: distinguished from that of the tertian type of fever by *fewer pigment granules of larger size*, a seventy-two hour cycle of development, the red corpuscle containing the parasite *not becoming so swollen* as in the tertian, being little altered in size

In Manson's "Tropical Diseases," published since this paper was written, at page 36, he says that the benign tertian and quartan parasites never form crescents. He has, therefore, changed his opinion on this subject, or, which is more likely, the statement of his belief, in the *British Medical Journal* quoted, is incorrectly reported.

November to April, both included, while there were nineteen cases of the same fever noted from May to October. These figures do not represent the real proportion of seasonal occurrence of the fever, for, while I am tolerably certain that I did not overlook a single case during the first six months mentioned (winter-spring period), as I was specially on the outlook for them, in the second (summer-autumn) six months I do not include in the nineteen cases noted above all that came under treatment, but only those I had time to examine for the presence of the parasite. No "malignant" cases were met with originating in the Shanghai district that year. Thus the term "spring" tertian is not an appropriate one at any rate in the district referred to, it being much more a "summer-autumn" fever as to prevalence, but by no means malignant in character. It is therefore obvious that the term "summer-autumn" should be used not with regard to prevalence when designating a

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A form of tertian fever is described by Marchiafava, Bignami and others and named by them "summer-autumn," or "malignant," tertian to distinguish it from the "benign," which they also designate "spring," tertian, occurring in Italy at the season thus indicated. Whilst these designations may be appropriate in Italy and represent seasonal prevalence of different fevers, they certainly could not be used in the same sense in speaking of the tertian fevers occurring in the Shanghai neighbourhood. From my notes in one year five cases of benign (spring of the Italians) tertian I find occurred from November to April, both included, while there were nineteen cases of the same fever noted from May to October. These figures do not represent the real proportion of seasonal occurrence of the fever, for, while I am tolerably certain that I did not overlook a single case during the first six months mentioned (winter-spring period), as I was specially on the outlook for them, in the second (summer-autumn) six months I do not include in the nineteen cases noted above all that came under treatment, but only those I had time to examine for the presence of the parasite. No "malignant" cases were met with originating in the Shanghai district that year. Thus the term "spring" tertian is not an appropriate one at any rate in the district referred to, it being much more a "summer-autumn" fever as to prevalence, but by no means malignant in character. It is therefore obvious that the term "summer-autumn" should be used not with regard to prevalence when designating a

tertian fever. It is also used by various writers to indicate the fevers with which crescents are associated, and here I venture to suggest that the term will also be found inappropriate as our knowledge of these fevers and their parasites extends.

Of other than the tertian and quartan fevers referred to above having their origin near Shanghai, I have to report only one case in which crescents were found. That case was met with after a two years' search, and had not been absent from Shanghai for six years, nor had he suffered from fever previously. Crescents were found on the eighth day of the fever, having been preceded by a few, small, ring-shaped, motile organisms, endocorpuscular, with one or two granules of pigment. The fever was of irregular type. The crescents, present ten days after cessation of fever, were not found 17 days later still, on his return from Japan, and there has been no return of fever for now nineteen months. No other case has been met with during $3\frac{1}{2}$ years by me, and to this has to be added a similar experience of five other observers in the same region. Whilst this has been so with fevers of local origin, crescents have been found in the blood of patients suffering from fever contracted before coming to Shanghai from Hongkong, Siam, and Java.

My observations have been almost entirely confined to the non-native population. Dr. Milles, who has examined native cases at the Shantung Road Hospital, tells me that as yet he has not met with one case furnishing crescents.

I have found malarial parasites in fifty cases, in most of them on several occasions, in some for diagnostic purposes once only. This paper is based on the notes of these cases made at the time of examination. Movement of pigment granules, slow or rapid, "swarming" as the rapid movements are usually styled, the occasional escape of parasites from the red corpuscles into the blood serum, the formation of flagellae chiefly from spheres of the crescent series, the so-called sterile and quinine forms, free pigment, pigmented white corpuscles, the latter exhibiting phagocytic action towards both parasites and pigment, were all repeatedly observed and furnished material for observations of absorbing interest.

Special symptoms in relation to the distribution of the parasites. It has been pointed out chiefly by the Italian pathologists that in the malignant forms of malarial fever are sometimes special symptoms, distinctly traceable to the location of the parasites. In cases which have had choleraic symptoms, it has been shown after death that the capillaries of the intestinal villi may be found blocked with parasites, which may not have been, or but sparingly, found in the peripheral circulation during life. Similarly it has been shown that coma has been associated with a like blocking of cerebral capillaries.

In two of my cases, one presenting crescents and the other a benign tertian, cough was a prominent and distressing symptom, whilst one of the cases exhibited greatly quickened respiratory movements with some degree of

dyspnœa, these passing away on the cessation of, and recurring with the return of, the fever, there being no physical signs. Were these symptoms due to some degree of invasion of the pulmonary capillaries? In one case of quartan fever, pain of intensity requiring relief by morphia hypodermically was present in the lower part of the back and pelvic region of a lady, recurred with each paroxysm and in two separate attacks. No explanation could be found of this local disturbance, which suggested some local distribution of the parasite in the lower spinal or pelvic regions. This case became markedly jaundiced at each attack, and this is a condition I have met with in several cases, developed after the second or later paroxysms and repeated in the same individual in other attacks, evidently due to the destruction of the red corpuscles by the parasite, release of pigment into the serum and its solution and diffusion into the tissues. Pains in the region of the spleen and in the bones are frequently complained of, and are said to be due to the presence of the parasite in the spleen and bone marrow where they have been found especially congregated.

The effect of treatment on the parasite. In certain cases, rest and plenty of good food, where these had been conspicuously absent, have sufficed without medicine to stop the paroxysms. In one such case, whilst the temperature, taken four-hourly, did not rise above 99°, parasites were to be seen in scanty numbers developing in their 48-hour cycle, but evidently in insufficient number to cause fever, the rest and diet enabling the patient to fight his battle so far successfully with the parasite but not to kill it, or, at all events, not to cause its disappearance from the blood as when quinine is given. The occurrence of the parasite as described in this case doubtless represents what might be seen in other cases before the paroxysms manifest themselves, but we are seldom placed in circumstances in which it is possible to make the examination necessary to determine this. Most of the cases were dosed with 15 to 30 grains of quinine by the mouth, either in solution or tablets. This drug can be given successfully at any period of the cycle, but, I have found that if it is given when the temperature is falling or immediately after a paroxysm, the next paroxysm is tolerably certain to be prevented or rendered abortive in a simple tertian or quartan. The patient may be assured of this with safety, but if he has double tertian, double or triple quartan, in fact if there be more than one generation of the parasite present in the blood, the next paroxysm may be as violent as its predecessor, from which it would appear that the quinine has a more potent action on the spores or very young parasites, probably before they have buried themselves in the red corpuscles. Either their greater growth, or this situation in the corpuscles, enables them to resist the action of the quinine. Its effect in preventing sporulation can be watched, and a little experience gained in this way will enable the observer to say how the fever will behave at its next paroxysm.

When over-exertion, want of sleep, over-work, diarrhoea or any exhausting condition has been present and contributed in aiding the parasite to overcome the resisting power of its host, the continuation of these conditions may be seen to defeat for a time the effect of the quinine.

When that drug has been vomited, as it often is by children, I have been in the habit of administering it by suppository and with as good results as by the mouth, in doses half as large again as when given in the latter way.

How does the parasite find entrance into the body? Until its life history outside the body is determined, this difficult problem will not be solved with certainty. The researches of Ross in India, instigated by Manson's suggestion of the escape of the parasite from the blood through the instrumentality of mosquitoes and other blood-suckers, promise to throw some light on this question.

There are three possible avenues of entrance of the parasite: (1) by inoculation through the skin, (2) by the respiratory and (3) by the alimentary tracts.

(1). The parasite must be capable of inoculation through the skin, unless it enters the body during a stage of its existence at which it is provided with a covering or amongst material from which it must be separated by the digestive process, before it can enter the circulation either directly or indirectly after a sojourn in other tissues. It would be strange indeed if it could not be inoculated, since the parasite multiplies in the blood generation after generation. The little experimental work that has been done in this direction, at the most, goes to prove that the disease can be conveyed from the sick to the healthy, by conveying blood from the former to the latter circulation. That this, however, is the usual method of propagation, by mosquitoes as has been suggested, is not likely to be the case. First attacks of the fever occur in places and at times where and when mosquitoes are not to be found.

Entrance by (2) alimentary or (3) respiratory tract is much more likely, and this at once suggests the question of the vehicles or carriers. Is the parasite air, water or food-borne? is the disease a "place" one? Before attempting to answer any one of these questions, it is of primary importance to realize and to keep in mind constantly during their discussion, the fact that they by no means exclude each other and in some cases that they are interdependent. Too often in relation to disease causation they are dealt with as independent and sometimes as opposed to each other. It is self-evident that if a disease germ be air-borne, that this may lead to contamination of water, food, and it may be of places. Organisms that do not retain their vitality when dried are not likely to be air-borne. So far as I am aware no experimental work has been done, proving that the dried malarial parasite can produce the disease, though Cantlie reports in the Medical Annual, 1898, that when dried they recover their power of movement under certain conditions of warmth and moisture.

Nineteen years ago an adult member of my family circle in mid-winter suffered from tertian fever which a year later again manifested itself, but has not since returned. The attacks were typical. At that time our water supply was stored in and brought from a region noted as the most prolific source of malarial fever in our vicinity. Shortly after these attacks, for other than malarial reasons, suspecting the water and filter, we had our table supply distilled daily. This was done for five years, after which all water for drinking purposes was taken from a Pasteur, and later from a Berkefeld, filter. If the infection was air-borne, it is strange that in this case there has been no recurrence for eighteen years. This case was a town resident. On the other hand, the following case seems to support an air-borne method of infection. Eighteen years ago an adult lived in the country, worked by day in the town, and suffered from numerous attacks of intermittent fever. After some months, by my advice he removed into town, when the fever ceased and did not recur until fifteen years later when he again took up his residence in the country, two miles distant from his previous country residence, where tertian fever began and continued for eighteen months in spite of quinine, arsenic, holidays, etc. This patient slept on the ground floor contrary to advice till five months ago, when he removed to a first floor bed-room, since which time he has had no more fever and has taken no more medicine. Previously to sleeping upstairs the fever had never been absent a month at a time. He now occupies a second floor bed-room. His work has been in the settlement from 8 a.m. till the evening.

The greater incidence of malarial fever amongst those living outside than amongst those living inside the settlements, might be regarded as due to parasite tainted air or food surroundings. If air-borne, the organism cannot evidently be borne far, else town residents would suffer more than they do. If not air-borne, contamination of food and water, affecting country rather than town residents, is a unique occurrence in disease causation. On the other hand, a parasite, borne by air for short distances, would account for the greater incidence of its disease amongst country and suburban than amongst town residents, and also would be more likely to find entrance into the food and water supplies of the former *after sterilisation by cooking*.

Paddy fields not drained and often maintained in a water sodden condition, were formerly numerous in the vicinity of Shanghai, but are now there almost entirely replaced by wheat, barley and cotton fields. Since 1883 a good and plentiful water supply has been in general town use amongst foreigners and latterly in suburban use. These two causes doubtless account in some measure for the decrease in the number of malarial fevers of latter as compared with former times amongst foreigners, notwithstanding a considerable increase in their numbers.

Shanghai, May, 1898.

OPHTHALMOLOGICAL TERMINOLOGY.

By JAS. B. NEAL.

Several months ago the writer—in anticipation of issuing a new edition of his book on Diseases of the Eye—sent to each of the members of the Committee on Nomenclature of the Medical Missionary Association a comparative list of ophthalmological terms; the list embracing all the different names which had been suggested for the various parts and diseases of the eye, so far as known to the writer. Each one was asked to indicate his preference in regard to the old terms or to suggest new ones. When all the members of the committee had been heard from, a new list was made out, showing what the result of the vote had been, and the members were again asked to record their preferences. The result of this second canvassing of the subject is seen in the following record, which it seems desirable to publish in order to show what progress is being made, and to assist in attaining the unanimity which is so desirable. It was hoped that a meeting of the committee might be held in Shanghai this spring, in which case a definite decision might have been arrived at, but circumstances were not favorable to such a meeting, so the whole question is still open for discussion. As will be seen from a glance at the list a good degree of agreement has already been arrived at, which it is to be hoped is a good omen for early unanimity.

The members of the committee at present are as follows: Dr. Kerr, of Canton; Dr. Whitney, of Foochow; Dr. Porter, of P'ang-chuang, Shantung; Dr. Cousland, of Swatow; Dr. Stuart, of Nanking; and the writer, of Chinanfu. The preferences of each are indicated by the initials on the list.

Accommodation	視遠近之力	unanimous.
Albino	白公 K. P. N. S. 白體症 C. 白子 W.	
Ametropia	眼光謬曲 P. W. C. S. N. 眼光謬折 K.	
Ankyloblepharon	眼胞連閉	unanimous.
Anterior chamber	前房	"
Aqueous humor	前房水	"
Arcus senilis	老眼環 K. W. S. N. 遮環眼 P. 環眼 C.	
Asthenopia	弱視眼	unanimous.
Astigmatism	散光眼	"
Blepharitis	睫炎 K. C. S. N. 眼胞炎 P. W.	
Blepharospasm	眼環肌抽	unanimous.
Cauliculus	淚脰	"
Canthus external	外眦	"
" internal	內眦	"

Capsule of lens	睛珠衣		unanimous.
Cataract	障	C. W. S. N.	內障 P K.
„ anterior-polar	睛珠前障		unanimous.
„ capsular	睛珠衣障		„
„ posterior-polar	睛珠後障		„
„ zonular	睛珠間障		„
Chalazion	眼胞核大	K. P. W. C. N.	睫腺庖 S.
Choked disk	眼膈輪炎		unanimous.
Choroid	血衣		„
Choroiditis	血衣炎		„
Cilia	睫毛		„
Ciliary ligament	睛筋		„
„ muscle	睛肌		„
„ processes	睛摺		„
„ „ inflam-			
„ „ mation of	睛摺炎		„
Color blindness	盲色	K. W.	味 C. P. S. N.
Conjunctiva	睛衣		unanimous.
Conjunctivitis	睛衣炎		„
„ catarrhal	睛衣涕炎	K. W. P. C. N.	睛衣泗炎 S.
„ granular	睛衣粒炎	P. W. K. N.	睛衣炎 C. 睛衣生翳 S.
„ phlyctenular	睛衣胞炎	K. W. C. S. N.	睛衣點炎 P.
„ purulent	睛衣膿炎		unanimous.
Cornea	明衣		„
„ abscess of	明衣膿瘡	W. P. K. N. S.	明衣膿腫 C.
„ inflammation of	明衣炎		unanimous.
„ opacities of	明衣癍	C. K. W. N. S.	明衣炎癍 P.
„ staphyloma of	明衣凸		unanimous.
„ tumors of	明衣瘤		„
„ ulcer of	明衣瘍		„
Ectropion	眼胞外翻	K. P. W. N.	眼胞捲外 C. S.
Eutropion	眼胞內翻	K. P. W. N.	眼胞捲內 C. S.
Eye-ball	眼球		unanimous.
Eye-brows	眉毛		„
Eye-lashes	睫毛		„
Eye-lids	眼胞		„
Fissure of lids	目際	K. P. W. C. N.	睫際 S.
Focus of light	光心		unanimous.
Fundus of eye	眼底		„

Glaucoma	青光眼		unanimous.
Glioma	眼腦衣毒瘤	K. P. N. W.	眼腦衣胚珠瘤 C.S *
Hemianopia	偏視眼		unanimous.
Hordeolum	睫癰	K. P. C. S. N.	睫瘡 K.
Hyalitis	大房水炎	K.P.N. 大房膠炎	C.後房水炎 W.S.
Hypermetropia	遠視眼		unanimous.
Hypopyon	前房墜膿		"
Iridectomy	剪眼簾		"
Irido-cyclitis	眼簾並睛摺炎		"
Iris	眼簾		"
„ coloboma of	缺眼簾		"
„ hyperaemia of	眼簾積血	K. P. W. S. N.	眼簾盈血 C.
Iritis	眼簾炎		unanimous.
Keratitis	明衣炎		"
„ suppurative	明衣膿炎		"
„ ulcerative	明衣瘍		"
Lacrymal canaliculus	淚脰		"
„ gland	淚核	K. P. W. C. N.	淚腺 S.
„ sac	淚囊		unanimous.
Lens crystalline	睛珠		"
„ convex	凸鏡		"
„ concave	凹鏡		"
„ cylindrical	半桿鏡		"
„ „ convex	半桿凸鏡		"
„ „ concave	半桿凹鏡		"
Macula lutea	黃點		"
Meibomian glands	睫毛油核	K. P. W. C. N.	睫脂腺 S.
Mydriasis	瞳大	C. K. S.	瞳人大 P. W. N.
Myopia	近視眼		unanimous.
Nasal duct	淚總脰		"
Night blindness	夜盲		"
Nystagmus	輓眼	K. P. W. N.	瞞 C. S.
Ophthalmoscope	驗眼鏡	K. W. P. N. S.	眼返光鏡 C.
Optic disk	眼腦輪		unanimous.
Optic nerve	眼腦線	W. P. K. C. N.	視腦經 S.
„ „ inflam-			
„ „ mation of	眼腦線炎	K. P. W. N.	眼腦炎 C.視腦炎 S.
Pannus	明衣血翳		unanimous.
Papillitis	眼腦輪炎		"

* Dr. Stuart's approval of this term is subject to changes in histological terminology.

Posterior chamber	後房	K. P. C. N.	中房 W. S.
Prolapse of iris	眼簾脫		unanimous.
Pterygium	贅肉扳睛	K. W. N.	贅肉扳睛 P. 眼翳 C. S.
Presbyopia	老視眼	C. K. S. N.	花視眼 P.
Ptosis	睛上胞墜		unanimous.
Pupil of eye	瞳	K. C. S.	瞳人 P. W. N.
Retina	眼腦衣		unanimous.
„ glioma of	眼腦衣毒瘤	K. P. N. W.	眼腦衣胚珠瘤 C.
„ hyperaemia of	眼腦衣積血	K. P. W. S. N.	眼腦衣盈血 C.
Retinitis	眼腦衣炎		unanimous.
Scleritis	眼白衣炎		„
Sclerotic	眼白衣		„
Staphyloma of cornea	明衣凸		„
Strabismus	斜眼		„
„ convergent	內斜眼		„
„ divergent	外斜眼		„
Symblepharon	胞球相黏	C. K. S. N.	眼胞相黏 W. P.
Sympathetic inflammation	串眼炎	C. P. W. N. S.	眼串累炎 K.
Synechia anterior	眼簾前黏	K. P. W. S. N.	簾前黏 C.
„ posterior	眼簾後黏	K. P. W. S. N.	簾後黏 C.
Tarsal cartilage	睫軛骨	K. P. C. N.	睫軛 W. S.
Trichiasis	睫毛擦眼	K. W. C. S. N.	睫擦眼 P.
Vitreous chamber	大房	K. P. C. N.	後房 W. S.
„ humor	大房水	K. P. C. N.	後房水 W. S.
„ „ inflam-			
„ mation of	大房水炎	K. P. C. N.	後房水炎 W. S.
Yellow spot	黃點		unanimous.



THE ANÆMIAS, WITH SPECIAL REFERENCE TO THE HISTOLOGY, MORPHOLOGY AND CHEMISTRY OF THE BLOOD.*

By GEO. A. STUART, M.D.

The blood is a very complex substance, containing all the materials for, and products of, the metabolic processes of the body. So it is difficult to arrive at its exact composition, either chemically or histologically, for the reason that this varies very much in the different parts of the organism, and

* In part, a paper read before the Nanking Medical Association.

in the same part at different times. In the reparative processes of the body it becomes a feeder of the lymph, which in turn feeds the cell. It yields up its albuminoids for tissue repair and growth, and receives from these tissues waste nitrogenous matter. It gives over its hydrocarbons and oxygen to be burnt up in the tissues, and receives in turn carbon dioxide and water. It enters the liver laden with dextrose, and there gives it up to be stored away in the liver cells as glycogen, and receives in return large quantities of urea which this organ has manufactured out of the nitrogenous waste of the body. This substance it carries to the kidneys to be excreted, and comes away from this organ freed from this class of poisonous bodies and ready once more for the work of fetching and carrying for the organism. To simply mention the substances found first and last in normal blood would require a long list, which shows the exceedingly complex character of this fluid and the impossibility of stating its composition in anything more than general terms.

But there are certain elements of the blood that are tolerably constant, and upon which its function largely depends; and it is change in these elements, or perversion of their functions, that constitutes that class of affections that may properly be termed diseases of the blood, so it may be well to briefly pass in review our present knowledge of the structure and composition of the normal blood, as well as certain points in its morphology and physiology, in order to a better understanding of the pathological conditions found in the difficulties usually classed under the general terms *anæmia*, *chlorosis*, and the like.

The blood is made up of a fluid portion called the plasma, and the cell bodies called the corpuscles. The plasma contains fibrinogen, which, in the presence of fibrin ferment from the corpuscles, coagulates to form the clot. When the clot is separated, a clear, straw-colored fluid is left, called the serum. The plasma of the blood plus leucocytes (lymphocytes) is practically the lymph, as found in the lymph channels, and this fluid is derived from the blood by a process of physiological filtration, so that what may be said about blood-plasma or blood-serum will hold equally true in regard to lymph-plasma or lymph-serum. The serum contains the two proteids, serum-albumin and serum-globulin, to the average amount of eight per cent. It also holds in solution hydrocarbons, neutral fats, and inorganic salts, besides various waste products, as urea, uric acid, kreatin, and carbon-dioxide. This latter substance is found either in solution in the serum, or in a state of loose combination with certain bases. A much smaller amount is found in the corpuscles, and here it is in much more stable combination.

The pigment hæmoglobin makes up the greater part of the solids of the erythrocytes, the remainder being the proteids of the protoplasm and about two per cent of salts. The most remarkable property of hæmoglobin is its power of combining loosely with oxygen when exposed to an atmosphere

containing it, and of again giving it up in the presence of oxidizable substances, or in an atmosphere in which the partial pressure of oxygen has been reduced below a certain limit. It is this property which enables hæmoglobin to perform the part of an oxygen carrier to the tissues. In arterial blood it is found in this state of loose combination, and is here called oxy-hæmoglobin, its color being bright scarlet. But in venous blood it has parted with the larger part of its oxygen, and is therefore called reduced hæmoglobin, and is much darker in color. This pigment does not enter into combination with carbon-dioxide, but the serum, and in a small measure the fluids of the erythrocytes, becomes the carrier of this gas. Therefore the dark color of venous blood is not due to the presence of carbon-dioxide, but to the absence of oxygen. A specimen of "arterial" blood may contain as much per cent of carbon-dioxide as another specimen of "venous" blood, without affecting its color.

Other gases, such as carbon-monoxide, nitric-oxide, and hydrocyanic acid enter into combination with hæmoglobin, and the union is more stable than that with oxygen. Therefore these bodies entirely destroy the oxygen-carrying power of hæmoglobin, and unless life can be prolonged until a sufficient number of new erythrocytes are produced to carry on this function of the blood, the patient dies. The product resulting from these combinations is called carbon-monoxide hæmoglobin, and changes the blood to a bright cherry-red color, thus readily distinguishing it from cyanotic blood.

Water readily dissolves the pigment out of the erythrocyte, and in blood of low specific gravity, or after the use of certain poisons, such as chlorate of potassium, phenol, arsenic, the mineral acids, antipyrin, phenacetin, sulphonal, and tincture of iodine, in large doses, especially if used hypodermically, it will pass out of the cell into the serum, producing the condition known as hæmoglobinæmia, which may—probably will—be followed by hæmoglobinuria. These conditions are also frequently found after severe attacks of acute infectious diseases and severe injuries, as scalds, burns, or frost-bite. In this condition the erythrocytes are found to be pale, while the serum is redder than normal.

The question as to whether quinin can produce hæmoglobinuria is an interesting and a practical one. Many Italian physicians, notably Bastianelli, Tamaselli, and in a certain measure Laveran, hold to the view that it has such an effect. Tamaselli even claims that it can produce an icterohæmaturic fever closely simulating that met with in Africa and other hot countries. The view held seems to be that, while it is rarely or never seen in Italy or northern latitudes, it is increasingly prevalent as one goes south. Quinin does produce in certain persons skin eruptions or affections of the mucous membranes, and, arguing from the interdependence of function between these and the kidneys, one might expect that in certain cases these latter organs

would be affected by the administration of this drug. But hæmoglobinuria as produced in the infectious fevers and by other poisons is not the result of derangement of renal function, but of a primary hæmoglobinæmia. This condition results either from the action of the toxins upon the erythrocytes, leading to their disintegration, thus setting free the hæmoglobin, or to the dilution of the blood or the formation of salts in solution in the plasma which dissolves out the hæmoglobin from the erythrocytes. We can find no case on record where quinin has produced this condition except when it was used in the treatment of infectious fevers. In fact, it has been administered in all doses, to man and the lower animals, in health and disease, without showing any tendency to produce hæmoglobinuria. So the question simply resolves itself into this form:—The toxins of infectious fevers, and notably those of malarial infection, produce hæmoglobinuria. Quinin administered in health or for other difficulties, does not do so. Having then a dilute solution of quinin circulating in the blood, together with large quantities of a powerful toxin, such as that produced by the plasmodium malarie, is it logical to suppose that the drug had any part in the production of hæmoglobinuric condition? Ought we not rather to expect that the quinin would manifest its usual action, and by destroying the parasite in the blood relieve the condition upon which the hæmoglobinuria depends? It is also a notable fact that where malaria exists in its most virulent forms, hæmoglobinuria is most frequently met with, and that independent of the administration of quinin.

Inasmuch as most depraved conditions of the blood are marked by a deficiency in hæmoglobin a knowledge of the composition and source of this body is important. It is a substance that gives the reactions of a proteid, but differs from other proteids in containing iron and in being crystallisable. It is very complex in composition, no rational formula having yet been discovered for it, and the empirical formula given by different investigators varying very greatly. We give the one of Preyer simply to show its great complexity. This is $C_{600} H_{960} N_{154} Fe S_3 O_{179}$. Of great importance to its function seems to be the fact that it contains iron. Although the amount of this element contained is very small, yet this small amount seems necessary to the performance of its function. Whence is the iron supply of the food? This has long been regarded as an important question, and there has been much speculation on it in the past, but no satisfactory source of supply was found. The small and uncertain amounts found in drinking water are manifestly insufficient as a constant source of supply for so important an element, and to attribute it to the hæmoglobin taken in with the flesh of a meat diet is only setting back the question one stage in its investigation. There must be practically one common source of supply for all red-blooded animals. This has been found in nucleo-albumin, an iron and phosphorus-bearing compound, albuminous in character, found to exist in connection with the nuclei of cells,

and by some observers considered to be identical with Reinke's plastin, and by others with chromatin. It is proteid in character, but differs from other proteids in containing iron and phosphorus, and on account of this fact, as we shall see, becomes at once a neural and a hæmic food. "It is far more abundant in vegetable than in animal cells, and is especially abundant in the green vegetables and in the legumes."

It would probably be necessary to say "the *nucleo-albumins*," as animal nucleo-albumin and vegetable nucleo-albumin differ very much in their composition; the latter being, like the proteids of the vegetable kingdom, more highly complex than that derived from the animal cell.

"When this complex vegetable nucleo-albumin is taken into the stomach in the form of food, it, like the proteid of vegetable origin, is acted upon by the digestive ferments and rendered less complex, being by this process so transformed that it can be taken up from the alimentary canal by the epithelial cells that go to form the mucous lining. In its passage through these cells, or after it has entered into the system, it becomes, in part at least, isomerically transformed into animal nucleo albumin, and finally appears as such in the milk, in the egg, and in various structures of the body. Other portions pass to the liver and are there oxidized in the hepatic cells. In this manner the nucleo-albumin is split up, forming simpler compounds, such as hæmoglobin, lecithin, water, carbon dioxide, etc. It is highly probable that in this oxidation process the polymeric molecule gives place to the less complex or monomeric form, thus explaining the formation of the simpler form of nucleo-albumin as it is found in the animal kingdom.

"The hæmoglobin contains the iron that previously existed in the nucleo-albumin, and enters into the composition of the erythrocytes, giving to them their continuous supply as rapidly as it is exhausted in its natural metabolic destruction. The lecithin contains the phosphorus, and it enters into the nerve tissue, either as one of the component parts of this structure, or as an oxidizable food product for the direct stimulation of the nerve cells."

Nucleo-albumin must not be confounded with nuclein. It differs from the latter in containing proteid, and in containing little,—probably, in a pure state *no*—nucleic-acid, and in containing iron as well as phosphorus. The action of the two substances on the blood is also essentially different, the nucleo-albumin increasing the amount of hæmoglobin in the erythrocytes, while the administration of nuclein seems to produce an increased leucocytosis.

It is unfortunate that we as yet know so little in regard to the origin of the erythrocytes, as such knowledge would prove of the greatest value in the treatment of anæmic conditions. But we *do* know more, both from scientific investigation and empirically, than was known a few years ago. And the profession is not slow to take advantage of this knowledge in the treatment of the anæmiæ.

In the embryo these cells are developed primarily within the newly-forming blood-vessels as nucleated cells, which gradually either lose their nuclei, or are replaced by new formed, non-nucleated cells. Bizzozero and Torre have found that in birds this method of production continues within the capillary veins of the bone marrow. Later in embryonal development they are produced in the angioblastic connective tissue cells. Here the protoplasm of the cell acquires a reddish tinge and becomes condensed into a number of globules which gradually enlarge. The cell also produces a fluid in which these globules float, itself gradually elongating until it unites with processes from other cells, eventually forming a series of channels which unite with the vascular system. This process ceases at birth, except in those animals which are borne in a very immature condition, as the rat or the opossum.

After birth, according to Neuman, Bizzozero, and later noticed by many other observers, these cells are produced in the red marrow of bones, particularly that of the ribs. Two views in regard to their genesis are held by different classes of observers. One, that the nucleus of the marrow cell becomes colored, and with a small amount of protoplasm persists as the erethrocyte. The other view is that the protoplasm of the marrow cell is transformed into erethrocytes very much in the same way as in the case of the angioblastic connective tissue cell, the nucleus disappearing.

The view formerly held of the origin of the erethrocytes from the leucocytes of the blood and lymph may now be considered to have been proven untenable. The same may be said in regard to Hayem's hypothesis of their taking origin from the blood plaques. And the spleen, so far from being a factory for the production of these bodies, is now considered to be a furnace for their destruction after they have become worn out in the service of the body.

So, in accordance with the latest accepted view of the source of these important little organs, the manufacturing pharmacist is producing preparations of bone marrow for the treatment of anemic conditions. Theoretically, the administration of prepared bone marrow,—in the process used for the preservation of which all vitality must necessarily have been destroyed,—with the hope of thereby increasing the number of erethrocytes, would be a doubtful experiment, since this function is a vital, not a chemical, one. Practically, however, it seems to have proven of value in the hands of clinicians, and when combined with nucleo-albumin, as in the case of the preparation known as hemaboloids, has proven of great value in the treatment of secondary anemias and chlorosis. One observer gives a series of cases in which this line of treatment alone was followed, with the result that the hæmoglobin per cent., the number of erethrocytes per cubic millimeter of blood, and the body weight increased from the start; and the patients in

nearly every case were restored to their normal condition by the end of the fourth week.

The scope of this paper does not contemplate saying much about the leucocytes, since leucocytosis is now considered to be due largely to physiological conditions, or else to pathological changes in the lymphopoietic organs. That a knowledge of the amount of leucocytosis may be used with advantage in the diagnosis of many diseases, or even that affecting the amount of leucocytosis by medical or other treatment in certain difficulties may be a remedial measure of great value, is undoubted. But the amount and quality of the leucocytosis is of little importance in the simple and essential anæmias. The peculiar leucocytosis of leukaemia is only symptomatic of serious affection of the hæmopoietic and lymphopoietic organs, this disease being no longer considered among the anæmias. In fact the view is fast gaining ground that this disease is due to a specific infection, either bacterial or hæmatozoic.

Therefore the simple and essential anæmias may be considered to be modifications of two pathological conditions of the blood, one of which is deficiency of erethrocytes, or oligocythæmia; and the other deficiency of hæmoglobin, or oligochromæmia. And in the treatment of these conditions the physician can readily determine the measures indicated and estimate their efficiency by the constant use of the hæmocytometer and the hæmoglobino-meter. In most simple and secondary anæmias the oligocythæmia and the oligochromæmia are found concomitant. In chlorosis the oligochromæmia so far exceeds the other in importance as to be practically the only pathological condition present; while in progressive pernicious anæmia, a better term for which would be pernicious oligocythæmia, exactly the reverse condition is present.

We have very little to add on the subject of treatment to what has already been suggested. The relief of the difficulty upon which the secondary anæmia depends, good food of a suitable kind, pure air and water, exercise adapted to the patient's needs and strength, the proper kind of baths, regular habits of life; these will all readily appeal to the physician as important remedial factors.

After the digestive, circulatory, and nervous systems have been put into as good condition as possible, the body has been supplied with the necessary nitrogenised pabulum for its growth and repair, and the functions of the excretory organs looked after, there remains practically only two remedies that can add anything to the successful issue of the case. These are arsenic and iron. Of these the former is of great utility in oligocythæmia and of but little use in oligochromæmia, while exactly the reverse is true of the iron. Just how the arsenic acts in the cases to which it is adapted is not known; but that it does increase the number of erethrocytes and build up the blood is undoubted.

As we have already shown, the iron in organic combination, commonly found in the food as nucleo-albumin, is the only source of supply of this element to the system; and this supply is far in excess of the actual needs of the body. For the total amount found in the body at any one time is very small, ranging between 25 and 40 grains, or about .0025 per cent of the body weight; and the total output in the excreta within twenty-four hours is only about two grains, so that if the digestion, absorption, and assimilation of the iron compounds of the food is normal and is not interfered with by other conditions, the supply is fully adequate to the body needs. The condition that most commonly interferes with the absorption of the normal iron compounds is the ingestion of sulphur compounds or their formation in the alimentary canal on account of disturbances in digestion. In either case the iron enters into combination with the sulphur compounds, forming insoluble salts, which are carried off by the intestines.

Therefore we see three possible causes for deficiency of iron for the production of haemoglobin. First, an insufficient supply in the food, caused by taking an insufficient quantity of food, or in taking those foods not rich in nucleo-albumin. This is illustrated in the case of infants who are kept at the breast too long, the animal nucleo-albumin being inferior to vegetable nucleo-albumin in haemoglobin producing power. These infants are pale and waxy, although possibly plump and fat, and their color speedily improves after being weaned and put upon a diet partly vegetable. The anaemiate should be encouraged to use those foods rich in nucleo-albumin.

Second, the introduction of sulphur compounds with the food, or their formation in the alimentary canal, thus draining the nucleo-albumins of their iron before they have had a chance to be absorbed. In this case the avoidance of the sulphur compounds, or the administration of the inorganic iron salts in sufficient quantities to satisfy the sulphur compounds will allow the nucleo-albumins to be absorbed unchanged. And, to our mind, it is right here that we find the reason for the administration of iron. It is very doubtful if the inorganic salts of iron are absorbed at all, as they are not found in the excretions, except the faeces, when administered by the mouth, and when injected into the circulation are eliminated unchanged. It is also probable that during the period of digestion, when iron is usually administered, other salts of iron are converted into the chloride in the stomach by the hydrochloric acid of the gastric juice. If this be true, the administration of such fanciful preparations as the albuminates of iron would be of no special value, for upon entering the stomach they are converted into chloride and in the intestines into sulphide. They are not absorbed, but by satisfying the sulphur compounds leave nature's compound free to perform its function. For this purpose the chloride will answer as well as any preparation of iron.

In regard to anæmia resulting from the third cause, which is the interference with the chemico-physiological activity of the system by the presence of bacteria or the toxins of disease, it is not our purpose to say much. We only desire to say that iron salts are of no value in this condition, and sometimes prove harmful. For the anæmia does not depend upon the presence of sulphur compounds, but upon an inability on the part of the system to convert nucleo-albumin into hæmoglobin, and the administration of these salts may only tend to disturb the digestive system, thus hindering the digestion and absorption of those foods necessary for the maintenance of bodily strength. The only two diseases that are an exception to this rule, if indeed they are, are erysipelas and diphtheria, and in these we find that very tendency to the production of the sulphur compounds in the alimentary canal that stands as an indication for the administration of iron.

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SOLUTION OF HYDROGEN DIOXIDE.

By ROBERT C. BEEBE, M.D.

A reference in a recent number of this journal to the use of hydrogen dioxide suggested to my mind that it might be helpful to some who are in charge of hospitals in China to call their attention to the fact that a solution of this unstable compound can, with very little trouble, be prepared extemporaneously. I have made use of the solution for several years and find it a valuable addition to the physicians's armamentarium. The solution can be obtained from the United States, and will reach China in fairly good condition, but it is rather expensive, and as it gradually deteriorates, it is not practicable to keep a stock on hand.

By far the best way is to prepare the solution oneself as needed, which may be done as follows:—

Into a half-gallon bottle put three and a half fluid ounces of water and add to this one and a half fluid ounces of phosphoric acid. Shake well and set aside to cool.

Into another bottle, holding a pint and a half or quart, put eight fluid ounces of water and add, in a gradual stream, finely powdered barium dioxide, taking care that there are no lumps, that none of the barium sticks to the mouth of the bottle and that the bottle is well shaken to prevent lumps of partially hydrated barium dioxide, forming in the water. The bottle should then be set in a bath of ice-cold water, taking it out to shake vigorously every few minutes, until the hydration of the barium is complete, which will be shown by the swelling up of the dioxide so that little water settles out on top. If made during the hot weather and no ice is to be had the hydration can be accomplished by keeping the bottle in a bath of boiling water for half an hour, allow it to cool for an hour and then put in a bath of the coolest well water attainable for about three hours longer, shaking the bottle at frequent intervals during the whole process. The hydration of the barium dioxide is essential, and it can also be accomplished by keeping the bottle in ordinary well water and taking more time for the process.

After the thorough hydration of the dioxide it should then be poured, in several portions, into the diluted phosphoric acid in the larger bottle. During the intervals of the addition shake the mixture and control the heating caused by the chemical action by delay or putting the bottle in a bath of cold water. This mixture should then stand, with occasional shaking, until the test with litmus paper shows a *neutral* reaction, when it should be filtered through several folds of filter paper into a bottle marked for one pint.

When the liquid has drained through the surface of the magma on the filter, pour enough water on to this magma to bring the filtrate up to the pint mark in the bottle. You then have a pint of 3 % or ten volume solution of hydrogen dioxide. This contains a small portion of barium, which can be precipitated by adding a few drops of dilute sulphuric acid until there is a slight acid reaction. The precipitate is very fine, and gives a milky appearance to the solution. It cannot be easily filtered out, but it will soon settle, and the clear solution may then be poured off.

The solution is then ready for use. It should be lightly corked and kept in a cool place. Corking the bottle tightly will not prevent decomposition, and might cause the bottle to break.

The solution thus made deteriorates slowly, and will be found very useful in treating purulent discharges from the ear and in washing out abscess cavities, or wherever there is formation of pus.

E. R. Squibb & Sons, of Brooklyn, put up the materials for making the solution, in neat packages, but if ordered from them the sulphuric acid should be excluded from the package, for, even with the extreme care they always take with their goods there is almost sure to be enough oozing about the rubber stopper of the acid bottle to injuriously affect the contents of the package.

Philander Smith Memorial Hospital, Nauking.



Selected Article.

HYDROTHERAPY.*

By J. I. ROE, M.D.

During the past year or so our society has had under discussion a number of very interesting and profitable subjects with reference to therapeutics. "Cellular therapy" and "serum therapy" among the newer methods of the treatment of disease, have been amply and thoroughly presented. But to-night, for a little while, I want to invite your attention to one of the oldest means for combating disease of which the profession has any knowledge—to a remedy, and perhaps the only remedy, which has stood the test of centuries, and stands, to-day, by far the most useful of all therapeutic measures which we have at our disposal. I refer to the subject of hydrotherapy.

The history of this subject is most interesting. Undoubtedly the first mention of the use of water for the prevention of disease is found in Holy Writ. The laws laid down by Moses to the children of Israel, concerning ceremonial purification, enjoin very fully the use of baths, and might well find room for enforcement at the present day. The modern aseptic surgeon could scarcely formulate a better rule than that laid down by this ancient lawgiver: "Whosoever toucheth those things shall be unclean, and shall wash his clothes, and bathe himself in water, and be unclean until the even."

The very earliest medical writers showed a knowledge of hydrotherapy, and Hippocrates lays down principles which are both sound and practical in the light of nineteenth-century medicine. I quote a few sentences from his writings on this subject, which I am sure you will appreciate. "The

bath," he says, "is useful in many diseases. Sometimes it must be less used than it would be otherwise, from the want of accommodation; for in few families are all the conveniences prepared and persons who can manage them as they ought to be. And if the patient be not bathed properly, he may be thereby hurt in no inconsiderable degree, for there is required a place to cover him that is free of smoke, abundance of water, materials for frequent baths, but not very large, unless this should be required. . . .

In general it suits well with cases of pneumonia; for the bath soothes the pain in the side, chest, and back, concocts the sputa, promotes expectoration, improves the respiration, and allays lassitude; for it soothes the joints and outer skin, and is diuretic, removes heaviness of the head, and moistens the nose."

Asclepiades, the bosom friend of Cicero, was a warm advocate of water, and insisted upon being called a water doctor. He it was who founded the school of medicine which equipped for practice such illustrious men as Antonius Musa, the physician who saved the lives of the emperor Augustus and the poet Horace. Cornelius Celsus, the bosom friend of Ovid, and also Galen were his pupils. They were all ardent advocates of water, and applied it successfully in many acute and chronic affections. In later days Cheyne, Huxham, and Currie, well known in English medicine, and Hufeland, the celebrated German, were enthusiastic hydrotherapists, as were still later Neimeyer and Ziemssen. In our own country, and recently, this method has found warm and able advocates in Drs. Draper, H. C. Wood, Baruch, and others. To Dr. Baruch, I think, more than to any one else, belongs the credit of bringing and keeping before the medical profession this

* Reprinted from *Modern Medicine and Bacteriological Review*.

subject, and to his interesting writings I am much indebted for the material for the foregoing historical sketch.

It is well, at the outset, that we should not confuse the term hydrotherapy with that of hydropathy. The regular school of medicine knows no *pathy*, but adopts remedies, no matter what their nature, which are best adapted to the relief of disease. Dr. H. C. Wood holds that the espousal of water as a remedy by empirics is, to day, mainly responsible for the aversion of many physicians to its adoption. He asks, "Are we just to ourselves or to those who entrust their lives and health to our keeping in maintaining this attitude? Is it not rather our duty, nay, our happy prerogative, carefully to scrutinize, by modern methods of research, the past history of the application of water to disease, to ascertain the defects arising from its empirical use, and to wrest from the quack a weapon against disease whose power stands second to none in the catalogue of therapeutic agents?"

In works on therapeutics, it is the custom of writers first to give the physiological action, and then the therapeutic uses of any given drug. This is a wise plan, for if one is familiar with the action of a remedy from a physiological standpoint, he can apply the remedy with much greater intelligence and success to the various pathological conditions in which it may be indicated. So, I conceive, in considering the use of water in the treatment of disease, it is well that we should be familiar with its physiological action. Much progress has been made in this direction during the past few years, and we are now able to understand quite clearly the exact effects produced by the use of this agent, and are thus enabled to explain, from a scientific standpoint, its great value in the treatment of disease. Indeed, I believe that the chief reason why the use of water has not been more generally adopted is because the

rationale of its effect upon the system, as well as the technique of its application, have not been thoroughly understood. In some of the German schools special chairs are devoted to its teaching. I am not aware that such is the case in this country.* In fact, German writers comment on the lack of appreciation of hydrotherapy by Americans; but I believe the interest taken in this subject during the past few years in this country is such that it is now on a solid footing, and is quite as generally appreciated as by our brothers of the other side.

The general term "hydrotherapy" includes both the external and the internal application of water, cold, hot, or medicated. The subject, however, is such a vast one that I shall, at this time, consider only the external use of cold water.

In the first place it is of special importance that we study the physiological effects of cold as applied by means of baths, douches, or wet sheets or towels to the surface of the body. Winternitz, at the International Congress of Medicine held at Rome, read a most interesting and exhaustive paper on this subject, and the result of his researches has done much to place hydrotherapy on a rational, scientific basis. The limits of this paper will allow but a brief outline concerning this part of the subject.

The effects of the general application of cold upon the composition of the blood is to increase red blood corpuscles. The leucocytes were increased three-fold, and the hemoglobin fourteen per cent. This is accounted for by increased activity of the heart and circulation, and improved nerve tone, the red and white cells being thus driven out of the organs in which they were accumulated. The respiratory interchange of oxygen is increas-

*The author of this excellent paper is evidently not aware that the American Medical Missionary College, located at Chicago, Ill., has a chair of hydrotherapy, and gives a very thorough and extended course of instruction in this important branch of therapeutics—ED.

ed. It stimulates and gives tone to the nerve centers, from which all vital energy emanates. The pulse becomes twelve to twenty beats slower; respiration approaches the normal; desire to urinate ensues, and muscular power is increased. The rationale of this action is based, as before stated, upon the increase in red and white corpuscles, and upon invigoration of heart, lungs, and general condition.

With this brief outline concerning the physiological effects of the external application of cold water, let us now proceed to the consideration of its use as a therapeutic agent.

It will not be my object to attempt anything like a full study of this subject, but rather to deal, and that but briefly, with the value of hydrotherapy as it can be applied in the every-day practice of the general physician. There is certainly no means which has so universal an application, or is so flexible in its adaptability to the treatment of disease. Perhaps there is no condition which affords a better illustration of the value of cold water applications than that of typhoid and other infectious fevers. I presume we have all read, with much pleasure, that charming sketch from "The Doctor of the Old School," which describes so touchingly how Dr. MacLure and his friend Drumsheugh carried water from the spring, and with such rude appliances as they had at hand gave poor Saunders the thorough tubbing that saved his life. And I am sure we have all felt the joy of triumph which filled the heart of the good doctor as he and Drumsheugh threw off all restraint, and engaged in the bonniest of bonny Highland flings in the meadow by Saunders's house the next morning.

The control of temperature by cold applications has a great advantage over that by the use of antipyretic drugs. The latter masks the other symptoms and depresses the vital organs, and as Baruch tersely says, "Its only advantage is that it allows the patient to die with a normal

temperature." Not so with the use of cold water; and I cannot better describe its wonderful power than by quoting from a recent article from Baruch: "Place a patient suffering from any infectious disease, with high temperature, into a bath of 70° F. for fifteen minutes; practice active friction, and observe the result. Elevated temperature, rapid and perhaps feeble pulse, shallow respiration, dulled intellect, lost appetite, concentrated and scanty urinary and other secretions, indicate that the nervous system is overwhelmed by the products of infection. As soon as he enters the water, he gasps. The shock and subsequent stimulus to the cutaneous surfaces are conveyed to the nerve centers, and thence reflected to the heart, lungs, and other organs. Observation at the bedside at once renders these effects patent. The first effect is refreshment and enlivenment of the cerebrum. The eyes are opened; the face loses its apathetic stare; consciousness returns after one or more baths; the inspiration is deepened; expectoration is facilitated; the widening of the peripheral vessels and the stimulation of their coats relieve the heart; blood pressure is increased, and the laboring organ becomes as quiet as does a sea-tossed ship in the hands of a skilful mariner. The secreting glands are aroused to activity. Moreover, the temperature is reduced, not so violently as by medicinal agents, but more definitely, more in accord with normal tendencies. In brief, all the manifestations of the disease are favorably influenced because the normal standard is slowly, but steadily and lastingly, approximated under the influence of repeated judicious bathing. Even the most exacting demands of the most recent ideas are met by this treatment."

Undoubtedly the best method of applying cold in typhoid fever is by means of the bath. In hospital practice, where proper facilities are provided, and trained nurses at hand, this is quite a simple matter. A

portable bath-tub, fitted with a steel mattress which can be raised or lowered by means of an endless chain and ratchet, is placed in position by the side of the bed. A narrow piece of framework attached to the tub by means of a hinge forms a bridge between the tub and bed. A rubber sheet, perforated in the center, is placed under the patient, and he is gently drawn from the bed on to the mattress frame, which is then lowered into the bath, the perforation in the sheet allowing the water to pass through. The patient remains in the bath about fifteen minutes, during which time ice water is placed to the head and brisk friction made to the surface of the body, except, of course, the abdomen. The temperature of the water should be about 70° F. Where patients suffer very much from the shock of the bath, the temperature of the water may be higher at the beginning, and cold water gradually added until the required temperature is obtained.

The ingenious arrangement devised by Dr. A. H. Burr, of Chicago, and which was shown by Dr. Tyson at the last meeting of the State Medical Society, it seems to me, would make it quite possible to carry out this method in many cases in private families, provided one had the attendance of a trained nurse. Dr. Burr's tub consists of a large rubber sheet, to the margins of which iron rings are attached by means of elastic tapes. A folding crib is provided, which, being unfolded, forms a solid frame. The rubber sheet is first slipped under the patient, brought up over the pillow, and tucked up alongside of the body. The frame is then placed down over the patient, resting on the mattress, covered by the rubber sheet, and surrounding the patient and pillow. The edges of the sheet are then drawn up and over the top rail of the crib down to the lower rail and fastened by its rings. This makes a light and perfect tub, holding twenty gallons of water. It can be

emptied by syphon in four minutes. Both of the above-described tubs possess a great advantage in that the patient does not have to be lifted from the recumbent position in order to be bathed, thus avoiding what at first was an objectionable feature of the Brand method.

There are many cases—in fact the large majority of cases met with in private practice—where, for one reason or another, it is impossible to make use of either of these arrangements, and we must content ourselves with less heroic methods. I believe, however, we have in the wet sheets or towels, and in sponge baths, means which should always be made use of to reduce temperatures. And in all cases where the temperature reaches 102.2° or higher, applications of this kind should invariably be made. It is surprising how thorough and frequent applications, in this manner, will control fever, and add to the comfort of the patient. Some people fear to use cold water externally, thinking the patient will take cold. By directing the addition of a small quantity of alcohol to the water and assuring the friends there will then be no danger, prejudice of this kind can usually be overcome.

That there is a great value in the hydiatic treatment of typhoid is best proved by statistics. The mortality of this disease previous to the use of cold baths varied from twenty to thirty per cent. During 1894, Tyson treated thirty-one cases with a mortality of only three per cent. The year previous, before the bath treatment was started, his mortality was twenty per cent. Osler states that the mortality in Johns Hopkins for the year previous to the introduction of hydrotherapy was 24.2 per cent. For five years since its use has been adopted, the percentage of mortality is 7.3, the mortality in the cases bathed being 6.6 per cent.

In view of these figures who can doubt the importance of using this most valuable means of combating

disease? And what it has accomplished in typhoid, I believe it is capable of accomplishing in several other diseases.

For a long time I have been convinced that cold applications were the most rational treatment for inflammatory disease of the chest,—bronchitis, pneumonia, and pleurisy,—but I must confess that it is only recently that I have had the courage to put to test my faith in that treatment. At last, however, I am glad to say, I have made a break from poultices, turpentine, and camphorated oil, and for the past few months have treated nearly every case of this character, in both children and adults, by the use of cold compresses. And I am free to say that never, in my experience, have I seen as good results. If taken in the early stages, I firmly believe a great majority of cases can be aborted, and those which are not, I am sure are rendered milder, and all symptoms held under better control. I consider that in cases of children especially, this is the treatment. Boardman Reed, in a recent article, says: "Water locally applied is the most efficient single remedy or therapeutic measure which we have." Upon deciding to adopt its use, I anticipated no little objection on the part of friends and relatives, but I have been surprised that in not a single instance has its use been opposed. In order to overcome any possible prejudice, in this as in typhoid, I have had alcohol added to the water; and I would say, in passing, that I believe alcohol has, in this way, served me a better purpose than in any other to which I have applied it.

The technique of the application of cold water compresses is of some importance. I usually direct that a turkish towel be wrung out of water at a temperature of 80° F. to begin with, reduced gradually to 70° F. The towel is wrapped about the thorax and covered by a dry one, and, if at hand, both by oil silk. The applica-

tions are to be changed every fifteen to thirty minutes, according to the amount of pain and height of fever. I have been most highly gratified at results obtained by this procedure. The temperature is reduced, the respiration becomes slower and easier, the heart's action is improved, and pain relieved. In one case in which I used this plan the temperature was 106.5° F., and the beneficial effects were apparent within twelve hours, the patient having a rapid convalescence. Another case was that of a boy of five years who had never escaped a winter without a severe attack of broncho-pneumonia. A few weeks ago I was called, and found him in the first stage of his usual attack. Temperature 103°, pulse 140, and respiration 40, with all physical signs of beginning congestion. I ordered the usual remedies, but instead of the oil silk jacket formerly used, directed cold compresses. The next day he was decidedly better, and on the second day his condition was nearly normal, and he made a rapid recovery.

The only case in which I did not use cold compresses in the beginning was that of a child nine months old who had undoubted pneumonia. I could not quite trust those in charge with the application of cold, so used the old applications. The case progressed favorably for four or five days, when, owing to an unusual carelessness in exposing the child, there was a marked change for the worse. Temperature 104.5° and respiration and heart very rapid. At this last stage of the case I advised cold compresses, and was delighted, at my next visit, to find my little patient very much improved, and a rapid revolution took place in a few days. I could multiply cases similar to those cited several times, all treated with the greatest possible satisfaction, and I can commend, with the utmost confidence, its adoption by my brethren in the profession.

One of the most beneficial uses of the cold bath is in the treatment of catarrhal affections so prevalent in

this valley. "How shall I keep from taking cold?" is a question often asked, but seldom satisfactorily answered. I firmly believe that the taking of a cold bath, say 75° or 80° F., every morning, followed by a brisk rub, will so fortify the system that extraordinary exposure will not result in taking cold. Many of our patients cannot and will not take a full bath of this kind every day, and the next best thing is a cold sponge bath, especially to the upper part of the body. Even a thorough cold douche to the back of the neck which you all know seems to be especially sensitive to drafts and is usually the place where one feels the first chill that ushers in a cold,—I say a cold douche thoroughly applied to this place every morning will often prevent taking cold. Many of the cases of chronic nasal catarrh result from a frequent repetition of acute inflammatory attacks such as tonsillitis, otitis, pneumonia, etc., may be prevented in this way.

Some years ago I was the patron of a very intelligent and well-educated knight of the razor, who was a native of Hungary, and whose early life had been spent in that country. One day, as I sat in his chair for a shave, he regaled me with the following "fairy" tale: When a lad in his native land, he suffered at one time from a very severe and obstinate attack of ague. Every other day he would shake and burn and sweat. All remedies failed to cure his case, and he was persuaded at last to visit an old woman, who had a secret mysterious cure that never failed. One condition which she imposed upon all her patients was that the secret of the treatment should not be revealed. He went to her place a short time before the expected chill. He was taken to a small yard in the rear of her house, in the center of which was a large vat filled with clear cold water. Three times he was marched around the vat, and then instructed to lean over its edge and look intently until he perceived distinctly his own reflection in the water, the woman in

the meantime repeating some mysterious incantation. In the midst of this performance, and without the slightest warning, he was suddenly plunged headlong into the pool. Being speedily and safely extricated, he was given a brisk rub, and it is needless to say for the first time in weeks he escaped his attack of ague. And he assured me from that day he never again had a return of his malaria. I may have entertained some doubts regarding the veracity of the above story, but after reading the following from the pen of a recent foreign writer, Strasser, I am inclined to believe in its truth. Strasser says: "Malarial fevers, especially intermittents, are successfully treated by cold douches, 60° F., for two minutes, followed by friction for half an hour. The beneficial results are doubtless due to an increase in the number of leucocytes as described by Winternitz. Cases are on record which have resisted quinine, arsenic, and change of air for three months, and were promptly cured by the cold douche one half hour before the time for the paroxysm."

Dr. Geo. E. Clark, in a recent article in the *Medical and Surgical Reporter*, advocates the application of cold water in the treatment of appendicitis. "Cloths, about four inches square, wet in cold water, are applied to the right iliac region, and changed, if necessary, every three to five minutes until the pain is completely relieved. Cold enemata are given at the same time." He concludes his article as follows: "I am not a fanatic; I do not believe that cold water will cure every case of appendicitis; I do believe that surgical measures are sometimes necessary; but I do believe that cold water, used early, freely, and often, in the manner indicated, should first be tried, and if the symptoms do not improve within twenty-four hours, surgical measures should be considered."

"The only efficacious treatment for the pyrexia of sunstroke is the use of the cold bath in the most active form,

as these are cases which necessitate anything but temporizing measures. Ice to the head, and ice-water baths or sponging with brisk friction of the skin for the purpose of bringing the hot blood from the center of the body to the periphery, is the most satisfactory method of treating the disease. Antipyretic drugs will not control this form of fever, and are worse than useless." (Hare.)

A recent writer claims that by the conjoined use of taxis and the cold douche, 90 per cent. of all cases of strangulated hernia can be reduced in a few minutes, and that the use of anesthetics is seldom required.

There are many other diseases in which the treatment by hydrotherapy occupies an important place. I will not further weary you by going into details. The use of ice bags for meningitis and (if necessary) diphtheria is familiar to you all. Cold compresses in acute laryngitis and tonsilitis are always beneficial; and in the treatment of convulsions in children with hyperpyrexia there is nothing so important as the judicious application of cold water.

I cannot close this paper without just a word regarding the value of hydrothe-

rapy in many of the chronic asthenic cases which are so difficult to relieve by other treatment, and must once more allude to the great work which Dr. Baruch has accomplished along this line. Through his efforts there has been equipped, in New York, the Montefiore Home for Incurables, an institution which receives for treatment incurable cases only. Hydrotherapy is here carried out most thoroughly and most intelligently, and many cases that have been admitted, both from other hospitals which declined to retain them on account of incurability, and from private practice, have been discharged cured or greatly improved.

Most of these are desperate cases, including phthisis, diabetes, Bright's disease, and a variety of functional and organic nervous diseases which makes the institution the Salpêtrière of America. Of course, it is impossible in private practice to carry out hydropathic treatment with a degree of precision such as is applied in an institution of this kind; nevertheless, I believe many cases of the above-mentioned diseases can be greatly benefited by the judicious and intelligent use of such means as every physician can have at his command.

Medical and Surgical Progress.

FERMENTATION.

Fermentation is a process of decomposition, or of change, in the relations of the various elements of fermentable bodies. For the action of this process of decomposition or of fermentation, it is indispensable that certain "azotised" substances, named ferments, should be present. The substances all belong to the albuminous principles; bodies which in a moist condition putrefy and decompose spontaneously. Thus, a solution of pure sugar will not ferment, however long it may be kept; but if a decomposing—putrefying—azotised ferment, either animal matter or vegetable albumen, or gluten, or yeast, be added to the solution, the change quickly commences, and goes on until fermentation is complete. Vegetable juices, such as that of the grape and others, and even a solution of brown sugar, take on the process of fermentation spontaneously, because they contain sufficient azotised principles—approaching the putrescible albuminous animal matter in composition—to act as ferments. Milk also, takes on a spontaneous process of fermentation for the same reason, but it is not the alcoholic; no gas is evoked, and instead of spirit, a peculiar acid, the "lactic," is generated. Temperature, moreover, exerts much influence upon the process of fermentation, and some juices yield either alcohol or lactic acid, according to whether the process is carried on under a low or high temperature. The acetous fermentation, or that which results in the production of acetic acid, or vinegar, is carried on in a temperature of from 70° to 85° Fahr., and, of course, likewise requires the presence of a ferment. A certain amount of moisture and elevation of temperature is essential to the process of fer-

mentation; dryness and cold alike stop the action.

"The identity in composition of the chief constituents of blood, and of the nitrogenised constituents of vegetable food, has certainly furnished, in an unexpected manner, an explanation of the fact that putrefying blood, white of eggs, flesh, and cheese, produce the same effect in a solution of sugar as yeast or ferment."

The explanation is simply this, that ferment or yeast is nothing but a vegetable principle, resembling these animal ones, in a state of decomposition. As it is that modification of sugar only, named grape sugar, which is capable of being converted into alcohol, all fermentable substances, whether containing cane sugar, or starch, must be, and are, as the first step of the process, converted into grape sugar. Antiseptics stop the process of fermentation.

"The maturation, as it is called, or sweetening of winter fruits, when stored up for their preservation in straw, is the result of a true fermentation. Unripe apples or pears contain a considerable amount of starch, which becomes converted into sugar by the nitrogenous constituent of the juice passing into a state of decomposition, and transmitting its own mutations to the particles of starch in contact with it."

The researches of chemists and physiologists in connection with the phenomena of fermentation have thrown much new light on the subject, especially as regards its bearing on the origin and communicability of what is now termed zymotic disease. Pasteur, the eminent French chemist, has clearly shown that correlative with the chemical changes noted above, there always occurs in the process of

fermentation a continuous production and reproduction of minute organisms which begin life and terminate with the process; also that the varieties of ferments are numerous, and that each ferment possesses its own peculiarities and characters, sometimes aiding, often checking, and frequently proving detrimental to the processes when combined. Of the causes giving rise to alcoholic fermentation, the growth of the yeast plant is the best example; the wine ferment, and that occasioned in the expressed juice of fruit, although they partake much in common with yeast, differ from it materially in the size and shape of the cell globules. When fluids become sour and stale, the changes in their composition are due to the action of some particular ferment.

The lactic acid fermentation, which takes place in milk when it becomes sour, is traced to the presence of a small, oval-shaped bacterium. The butyric acid ferment and the numerous changes allied with the decomposition of urea and other animal substances, owe their existence to living cells derived evidently from the lowest forms of plant life. In fact, all substances liable to putrefy acquire the property of fermentation, and become capable of originating the process afresh in any organic matter of a like character brought within their sphere.

Fermented liquors—that is, beverages which have undergone the process of alcoholic fermentation—may almost be considered a natural product of warm climates from the readiness with which vegetable juices take on the process in these situations. The pure juice of the grape, if left to itself in a suitable temperature, will ferment in a few hours, and the palm-juice of Africa and other tropical countries, and the “pulque” of Mexico, are instances of the same thing. Ancient records, including those of Scripture, all tend to show that fermented liquors have been known and used from the earliest periods. In the

present day, the principal fermented liquors in use are—1, Grape wines; 2, domestic or home-made wines, which are for the most part rendered fermentable by the addition of sugar; 3, liquors made from fermented juice of the apple or pear; 4, malt liquors from various grains, principally barley.

The use of alcohol in combination with water, and with organic and saline compounds in the various forms of “fermented liquors” deserves particular notice on account of the numerous fallacies which are in vogue respecting it. It may be safely affirmed that alcohol cannot answer any of those important purposes for which the use of water is essential to their appropriation by the living body. Secondly, the ingestion of alcoholic liquors cannot supply anything which is essential to the due nutrition of the system, since we find not only individuals but whole nations maintaining the highest vigour and activity without ever employing them as an article of diet.—*Health.*

A NEW METHOD FOR THE RADICAL CURE OF INGUINAL HERNIA.

Of the invention of new methods for the radical cure of inguinal hernia there seems to be no end, and the constant occupation of surgical ingenuity upon this subject may be taken as an indication that no perfectly satisfactory method has so far been devised.

The latest contribution in the way of a new method of operating comes from Dr. George Ryerson Fowler, professor of surgery in the New York Polyclinic, who, in an instructive and well illustrated article published in the *Annals of Surgery* for November, 1897, argues that the methods of operation now in vogue, namely, that which bears the name of Bassini, with its modifications devised by Halsted and others, leave a weak spot in the abdominal wall at the internal ring, owing to the funnel-shaped protrusion of the ligatured sac, and the emergence of the cord at this point, which invite the recurrence of the hernia.

McEwen's method of avoiding this defect, by fixing the folded sac under the internal ring, Fowler criticizes as difficult to exercise satisfactorily. Kocher's method of drawing the displaced sac outward through an opening in the aponeurosis of the external oblique toward the anterior spine of the ilium, and attempting to close the canal without incising its anterior wall, is only applicable in cases without pathological alterations of the sac, and is mechanically a faulty method. Attempts to modify Halsted's operation, by directing the cord upward and outward for a short distance on its emergence from the abdominal wall and fixing it by sutures, have proved unsuccessful, as the weight of the testicle soon proved sufficient to drag the cord down into its normal direction.

As a result of recent experiences in which herniæ have recurred in adults after operations which followed the essential feature of the Bassini operation—namely, the displacement of the cord directly forward through the internal ring and muscular parieties—Fowler has devised a method, the essential feature of which consists of an intraperitoneal or backward displacement of the spermatic cord, allowing the complete closure of the internal ring by sutures. The essential features of the operation are the following: (1) A curved incision of the skin, allowing a flap to be turned upward, and exposing the canal, the anterior wall of which is incised; (2) separation and isolation of the sac and cord; (3) cutting away the sac at the level of the abdominal wall; (4) isolation of the deep epigastric artery and vein, and their division between ligatures; (5) incision of the posterior wall of the canal, including the transversalis fascia and peritoneum, upon the finger inserted through the neck of the sac. The operation is then completed by placing the spermatic cord within the peritoneal cavity, and uniting the transversalis fascia and peritoneum by broad approximation sutures in front of it until the lower end of the gap

in the posterior wall of the original inguinal canal is almost reached. The cord is then brought forward through the newly-formed external ring.

The canal is now closed by sutures of kangaroo tendon, which include the conjoined tendon and the aponeurosis of the external oblique upon the inner margin, and Poupart's ligament upon the outer; the new point of emergence of the cord is strengthened by the displacement outward of the pubic attachment of the corresponding rectus muscle.

Fowler commends his method as the only one which allows obliteration of the internal ring and inguinal canal, and has employed it in six cases, which, however, are of too recent date to allow of any estimate of permanent results. Although this method has certain features to commend it, the simpler operations of Bassini and Halsted with their modifications have of recent years met with such pronounced success that there can be no doubt of their efficiency in a large proportion of cases; and in those which present no extraordinary difficulties, there would seem to be no reason for discarding them for a method which is complicated by the additional steps of tying the deep epigastric artery and making an extensive incision into the peritoneum.

The conditions presented to the operator by different cases of hernia vary so greatly that no one method can promise success in every case. Experience may prove that in certain cases of large and long-existing herniæ in adults, in which the whole posterior wall of the inguinal canal is stretched and protruded forward, and in which there is marked stretching and atrophy of the muscular and aponeurotic structures, Fowler's method will have distinct value. The operation is certainly ingenious, and is devised to meet certain well known faults of the older procedures as applied to this class of cases.

Up to the present time no perfectly satisfactory method of disposing of the cord

in these cases without the extremely undesirable alternative of castration has been devised. If Dr. Fowler's method shall prove to have solved this problem, it will have very definite value.—*Boston Medical and Surgical Journal*.

MEDICAL HÆMORRHAGE.

Dr. Frederick J. Smith recently read an interesting paper on this subject before the Hunterian Society of London. Under this title he includes the following cases: All intracranial hæmorrhages not due to violence; hæmorrhages appearing from the mouth or nose, as "spitting or bringing up of blood;" epistaxis of youth or old age; bleeding from spongy gums or pharyngeal varicose veins; aneurysm of the aorta; hæmorrhage from the lungs in bronchitis, pneumonia, phthisis, emphysema, malignant disease, etc.; hæmorrhage from the stomach or duodenum; hæmorrhages appearing from the anus either as blood or mælena, or in typhoid fever and other forms of ulceration—*e. g.*, tuberculous or dysenteric; gastric hæmorrhage if not vomited; hæmorrhage from piles, internal and external; hæmorrhages appearing from the urethra, as blood in the urine; from bladder or kidney, from the vagina in women, metrorrhagia, menorrhagia, or postpartum hæmorrhage; and subcutaneously—purpura, idiopathic or rheumatic, etc., and scurvy. A mixed class of cases is due to serious disease—leucocythæmia, acute yellow atrophy of liver, some other forms of blood poisoning, and hæmophilia. This list, probably incomplete, is sufficient to show how important and frequent is that loss of blood which may be termed medical. After discussing the use of ergot (which he condemns in all arterial bleeding) and other agents generally used, Dr. Smith concludes his article with the four following propositions: (1) That most cases of medical hæmorrhage cease spontaneously and are essentially not dangerous to life from loss of blood. (2) That active

treatment by ice-bags and ergot frequently defeats its own purpose; if the bleeding ceases it does so in spite of treatment. (3) That where experience of morbid anatomy or the profuseness of the blood loss makes an arterial source certain ergot is distinctly contraindicated. (4) That complete rest, opium, and iodide of potassium are our most powerful and most trustworthy agents for the emergency, except in certain special cases—*e. g.*, from the stomach—where additional treatment by astringents should be applied.—*Lancet*.

RESULTS OF HAFKINE'S INOCULATIONS AGAINST PLAGUE.

The later successes which have attended M. Haffkine's further efforts in this direction deserve particular attention in view of their importance and of the unsatisfactory results of the Yersin serum treatment. Unlike the antitoxin serum, the prophylactic is easy to prepare, can be obtained in large quantities in the laboratory, and requires no animals in its preparation. It is simply a culture of the plague microbe in bouillon, and ghee or clarified butter, which, after a period of six weeks' luxuriant growth, is exposed to a temperature of seventy degrees C. to insure the death of the microbe. The culture is used without filtration, and in this condition contains the intracellular and extracellular toxins of the microbe, a combination which earlier experiences in anticholera inoculations indicated as likely to prove useful. The statistics are very remarkable, and would seem to show that in plague inoculations we have at the commencement and during the progress of an epidemic a powerful agent to assist in checking and controlling the disease. Statistics have been carefully collected at Kirkee, Bombay, Mora, Damaun, and Lanowli, the most important being the observations at Kirkee, Damaun, and Lanowli, where at each place the experiments were conducted with the inoculated and non-inoculated under similar

conditions. The results have been examined not only by Professor Haffkine and his assistants, but by Surgeon-Major Lyons, the president of the committee appointed by government to inquire into the plague in Bombay. Surgeon-Major Lyons visited the localities, and inquired carefully into each case.

In testing the efficacy of the plague inoculations the same method as far as possible is pursued as was adopted in the case of the anticholera inoculations. It consists in the selection of a group of persons living under similar conditions, inoculating a portion of that group, preferably a half, leaving the remainder uninoculated, and then noting the incidence of the disease on the two groups. At Kirkee, where plague broke out among the followers of the artillery, an excellent opportunity with these conditions presented itself, and the results were as follows: Eight hundred and seventy-five non-inoculated had one hundred and thirty-eight cases with one hundred and two deaths; six hundred and sixty-seven inoculated had thirty-two cases with eighteen deaths. The figures are strikingly in favor of the inoculations, for if the inoculated had had proportionately the same number of deaths as the non-inoculated, they would have had eighty-nine deaths instead of eighteen, a difference of seventy-one deaths, which is a reduction of nearly eighty per cent. The observations in Bombay and Mora are less instructive, because they are not comparative; still they are interesting and confirmatory of the favorable influence of the inoculations. In Bombay 8,112 persons were inoculated, and among this number eighteen were attacked with plague, sixteen of whom recovered and two died. The two fatal cases were ill with plague at the time of inoculation. In Mora Kolaba, a small place in which plague appeared, four hundred and nineteen of the inhabitants were inoculated; four of these were attacked, but all recovered. Such are the observations hitherto made, and it

seems to us that with plague gradually creeping from village to village and town to town in the Bombay presidency, an organized attempt, in addition to other sanitary measures, should be made to limit the ravages by inoculation.—*British Medical Journal*.

STERILISATION BY "FRYING."

There can be no doubt that the most perfect method of sterilisation, where it can be applied, is by heat. Baking, however, is a more or less uncertain process, while boiling is destructive to many substances. Moreover, the boiling temperature is so little above that which is fatal to microbial life that a considerable length of exposure to such a temperature is necessary. Frying, however, is another matter. Olive oil at a temperature of 160 to 180 deg. Centigrade acts very quickly, and with great power. To obtain complete sterilisation of an instrument it suffices to dip it for an instant into the hot oil, and that of syringes to fill them twice with oil at the temperature mentioned.

The temperature of the heated oil may be determined by a thermometer, but it is often more convenient to adopt the rough-and-ready methods of the cook by the aid of a bit of bread-crumbs. "It will be found that the bread-crumbs will become brown and crisp as soon as the temperature of 160 or 180 is reached." For the sterilisation of syringes all that is necessary is to heat a little oil in a spoon over a spirit lamp, testing it from time to time by bits of bread-crumbs, and, when the proper temperature has been attained, to fill the syringe twice with hot oil. All microbial infection will then have been destroyed.—*Exchange*.

DEATH FROM PUTTING A WISDOM TOOTH.

M. Heydenreich reported to the *Société médicale de Nancy* on February 25th (*Presse médicale*, April 9th) the case of a man, thirty-three years of age, brought to his

clinic and said to be suffering from mumps. There was high and persistent fever, rising to 104° F., with agitation, delirium, stiffness of the jaws, and swelling over the right parotid extending into the neck. When M. Heydenreich saw the patient, on the third day of the grave symptoms, the condition seemed to have improved. The temperature was from 102.5° to 100.1°, consciousness had returned, and the swelling was strictly limited to the angle of the right jaw. The patient could open his mouth, and a drop of pus escaped by the jaw. All the teeth were there. It was certainly a case of suppurative osteitis of the inferior maxilla, due to the eruption of a wisdom tooth. There was not at this time any indication calling for operative measures. The next day, however, the patient became semiprostrate, and in the evening the temperature rose to 104.9° F.; on the fifth day he was taken in a moribund condition to the hospital. There was complete left hemiplegia. A free incision was made by means of the thermal cautery as far as the zygoma, but no pus was found. He died next day at midday, the temperature being 98.9° F. The autopsy disclosed pus on the right side between the cranial vault and the meninges up to the level of the convexity, toward the median region, and suppurative osteitis of the cranium. On opening the meninges, a bed of very thick greenish-yellow pus (showing meningo-encephalitis) was laid bare. There was no lesion in the interior of the brain.

THE PREVENTION OF CINCHONISM.

An editorial in the *Therapeutic Gazette* says that within the last few years they have referred to the untoward effects produced by various drugs, and have called attention in particular to the disagreeable after-effects which often ensue when quinin is administered. With the more moderate of these effects nearly everyone is familiar, for the laity often prescribe quinin for

themselves in such large doses that they speedily experience the tinnitus, or deafness and headache which full doses of this drug so readily produce. There are two ways in which these disagreeable symptoms may to a certain extent be modified by combining with the quinin other remedies. The oldest way, and the method which is perhaps resorted to most frequently, is the administration with each dose of quinin of five or ten grains of bromid of potassium or bromid of sodium, which seem, to a considerable extent, to modify the neural symptoms which we have mentioned. If the dose has been a very large one, and the patient is particularly susceptible to quinin, it may be well to give at the same time with the quinin a little fluid extract of ergot for its tonic effect upon the cerebral and meningeal blood-vessels. Another method for the prevention of cinchonism is that which has been suggested by Aubert within the last few months. He asserts that the administration of atropin in the dose of 1-250 to 1-150 of a grain with each dose of quinin greatly modifies the symptoms, and in those cases where the quinin was given for the relief of the neuralgia aided the quinin very materially in relieving the pain. It must be remembered, on the other hand, that in those who have a susceptibility to atropin the dryness of the mouth and throat and the disordered vision which may ensue after this dose of the drug might prove more uncomfortable to the patient than if the quinin had been administered alone.

SOME RECENT ADDITIONS TO CUTANEOUS THERAPEUTICS.

Duhring—(*American Journal of the Medical Sciences*, April, 1897) recommends in cases of eczema of the forehead, where there is considerable thickening of the skin and exaggeration of the natural folds and lines, with hyperesthesia, the use of camphor as follows:—

R Camphoræ, $\frac{1}{2}$ drachm;
Emplast. plumbi, 3 drachms;
Vaselin, 3 drachms;
Ol. olivæ, 1 drachm.

M.

The amount of camphor may be lessened should it cause burning sensations. When heat and itching are prominent symptoms in eczema of the face, an ointment of acetanilid, forty to eighty grains in an ounce of cold cream, from its anæsthetic and cooling properties, serves to allay these sensations. In several desperate cases of eczema of the anus he has obtained much ease from the distressing burning and itching complained of by the use of:

R Sulp. ppt., 40 grains;
Naphthol., 20 grains;
Morphine hydrochlor., 2 grains;
Zinci carbonat., 60 grains;
Ceratum galeni, 480 grains.

M.

Unna (*British Medical Journal*, London, Oct. 17, 1896) suggested, under the name gelanthum, a solution of gelatin and tragacanth as a watery varnish, but the method of preparing it was tedious. Skinner (*British Journal of Dermatology*, London, February and May, 1897) has simplified it. Exactly the same result, he says, can be attained by swelling tragacanth and gelatin with water separately in a steam-bath for twenty-four hours, pressing through muslin while still hot, mixing, adding some glycerin, placing in the bath again for about an hour, straining, then making up to the required bulk with water in which some thymol has been dissolved to preserve the compound.

R Gum tragacanth, 2½ drachms;
Gelatin opt., 2 drachms;
Glycerini, 6 drachms;
Thymol, $\frac{1}{4}$ grain;
Aq. dest., q. s.

Place the tragacanth and gelatin each in ten ounces of water in covered jars, and make the final quantity up to twelve ounces with water.

This yields a uniform semiliquid preparation. It may be applied as an ordinary

ointment in the first place, afterwards being painted on with a camel's-hair brush, thus giving a protective film, which dries in from two to ten minutes, and is plastic, protective, and emollient. Another useful "film" is obtained when glycerin of starch is smeared thinly on the skin and allowed to dry on. The film produced is comparable to one formed by the purest gelatin, and is not so obtrusive. It is essential that it be allowed to become dry instead of rubbing it off the skin with a towel. An acetone collodion containing a little camphor is a very serviceable one, though not absolutely transparent: thus pyroxyline 10 grains, camphor 3 grains, acetone 1 ounce. Oil of cade or the tars generally mix best with acetone collodion, ichthyol with that made with ether and alcohol. Skinner also notes that calamine as ordinarily met with is very unsatisfactory, not only in its color, but also in its composition. If a good oxide of zinc be exclusively used for lotions or powders, reliance can be placed that the best and that most free from grittiness is provided. If boric acid is prescribed, the pulvis subtilissimus should be specified, and care should be taken that all soap is washed off the skin, as it is soluble, and will decompose any left on, which may cause the irritation sometimes complained of.

Schütz of Frankfort (*Arch. für Dermat. und Syph.*, Wien, 1897, heft 1), finding the severe treatment of lupus erythematosus not only led to irritation and aggravation of the disease, but that cases improved when let alone, and mild, non-irritating ointments applied, has tried weak arsenical solutions locally with success: Liqueur arsenicalis, 4.0; aq. dest., 20.0-30.0; chloroformi gutt. 2. This solution is painted on night and morning and allowed to dry. On the first or second day nothing is observed on the parts painted; on the fourth to sixth, slight swelling, increased redness, and tenderness appear. The further application is discontinued, and the part powder-

ed. In four to eight days the swelling subsides, the part grows pale, and scales. When this has ceased the painting is resumed; in six or eight weeks there is remarkable improvement, and in ten to twelve the lupus is generally cured. No scars remain, except where there has been previous atrophy.—*Edinburgh Medical Journal*.

WHAT DO WE EAT?

A French analyst some time ago, says the *British Medical Journal* for April 9th, amused himself by constructing a *menu* of the dinner of one who greatly daring would dine at a cheap restaurant in Paris. The exact items do not matter, but the general idea was that the diner after swallowing soup made from a meat extract preserved by the addition of borie acid, was regaled with fish preserved from putrefaction by the same means; that his vegetables had been preserved in a bottle and given, by the addition of copper, a bright green color which produced a delusive appearance of freshness; that his sweet was made from fruit preserved in a solution of salicylic acid; that he ate with his cheese, which itself was loaded with mutton fat or cotton oil, margarine spread on bread whitened with alum and made from flour to which plaster of Paris had been added to give it weight in the scales. These delectable viands were washed down with a plastered wine colored with fuchsine, while the liqueur with which he hoped to correct the evil effects of the rest was made of crude spirit sweetened with beetroot sugar and flavored with a coal-tar product. His coffee—but the analyst refused to discuss the coffee: the subject, he said, was too complex. M. de Nansouty has recently been withdrawing the veil which conceals the composition of coffee in France. He tells us that even the careful man who buys his coffee in the green berry is not altogether safe; very inferior berries are dyed to match the better sorts, or some of the

berries are made of clay molded and dyed to look like the genuine berries with which they are mixed. If he buys his berries roasted he is more easily deceived. The artificial berries in this case are made of coffee grounds mixed with baked flour. The berries, false and true, are then roasted with a little fat, white of egg, sugar, or molasses, and acquire a beautiful brown varnish "pleasing to the eye." The weight of both green and roasted berries is increased by exposing them to steam so that they imbibe moisture. But the man who buys his "coffee" ground is indeed rash. The list of constituent parts is long: chicory (which itself is sometimes adulterated!), beetroot, turnips, parsnips, carrots, dandelion, acorns, horse-chestnuts, hazel nuts, figs, pinnes, couch grass, pistachios, almonds, walnuts, peanuts, dates, apples, pears—all these substances, generally in "damaged" condition, are mixed together, ground and roasted, and mixed with a little real coffee.

RESECTION OF HALF A CANCEROUS STOMACH.

Deriajinsky (*Revue de Chirurgie*, No. 7, 1897; quoted from *Annales de la Société de Chirurgie de Moscou*, t. xv, No. 4) operated upon a woman, forty-six years old, who had been vomiting for nine months. She was in good condition, and a large tumor was distinctly felt. On opening the peritoneum a neoplasm was found occupying all the pylorus, nearly the entire lesser curvature of the stomach, and a portion of its posterior wall. In spite of its size the growth was extremely movable, and the author, deciding to remove it, completely dissected all that portion of the stomach in which it was placed—that is, the entire pylorus and the lesser curvature to the cardiac orifice. There remained only the lower half of the stomach, which was closed by suture and secured to the divided duodenum. The operation lasted three hours. The author stated later that the patient suffered from parotiditis and obstinate diarrhoea. The

wound suppurated. None the less the patient began to recover, but on getting out of bed five weeks after operation was taken with green vomiting, which lasted for five or six days, when she died with phenomena of cardiac paralysis. Autopsy showed death was due to septicemia, but the results of operation were satisfactory, the suture having held completely.

Although this case ended fatally it is interesting as showing that with better technique such extensive resection of the stomach may be a feasible operation.

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IODOFORM SUBSTITUTES.

Iodoform contains about twenty-nine parts of pure iodine in thirty. Its antiseptic and deodorizing effect is therefore due to this element; the carbon and hydrogen with which it is associated render the iodine non-irritant, either when taken by the mouth or applied topically. A great disadvantage attending the use of iodoform is its disagreeable odor. It is impossible to entirely mask this odor, although it may be covered to a great extent by mixing it with various aromatic substances, such as balsam of Peru, Tonquin bean, coumarin, menthol, thymol, oil of sassafras, attar of roses, oil of peppermint, oil of anise, oil of eucalyptus, carbolic acid, etc. A number of iodoform substitutes have been introduced, some containing iodine, and hence supposed to act like iodoform, and others with no iodine in their composition, but which have a similar action to iodoform. Many of these substitutes are proprietary articles of German origin. The results of inquiries made at hospitals, of pharmacists, and wholesale chemists and druggists, show that these iodoform substitutes have in no way diminished the use of iodoform, and that, in fact, they are in very small demand.

Iodol (tetra-iodo-pyrrol) stands at the head of the list of iodoform substitutes as regards the amount of iodine present. It contains about twenty-seven parts in thirty. Iodol is obtained by precipitating pyrrol

with iodo-iodate of potassium. It is a micro-crystalline, brownish white powder, having a faint thyme-like smell, and is soluble in six parts of absolute alcohol, but nearly insoluble in water. It is said to produce no toxic action like iodoform when wounds are dressed with it, and its application is painless. Iodol has been used with good results in granular and chronic conjunctivitis, hard and soft chancre, and various ulcers much improve under its use. It possesses some anesthetic action, and acts as an astringent when discharge is copious.

Losophan (meta-tri-iodo-cresol) contains twenty-four parts of pure iodine in thirty. It is a grayish crystalline powder, soluble in alcohol, chloroform, oils, and fats. It has been found useful in parasite skin affections, but not of general value, and it is apt to cause irritation.

Iodo-salicylic acid and di-iodo salicylic acid are iodine compounds of salicylic acid in which one or two atoms of hydrogen respectively are replaced by iodine. Di-iodo-salicylic acid contains twenty parts of iodine in thirty, iodo-salicylic acid fifteen in thirty. These compounds are powerful antiseptics. They possess the combined action of iodine and salicylic acid, and have been successful in the treatment of acute polyarticular rheumatism where salicylates have failed. These acids are in the form of white micro-crystalline powders, slightly soluble in water, soluble in alcohol, ether, fixed oils, and like salicylic acid, also in collodion.

Sozoiolol (di-iodo-para-phenolsulphonic acid) is composed of fifty-four per cent. iodine, seven per cent. sulphur, and twenty per cent. phenol. It has been combined with sodium, potassium, ammonium, lead, mercury, and zinc, which have been suggested as odorless substitutes for iodoform. The sodium salt which has been used is in colorless shining acicular crystals, soluble in water. The salt is well tolerated as an external application. It has been given internally in doses of twenty grains three times a day. Sozoiol-

dol has been found useful in the treatment of whooping-cough—three grains blown into each nostril once daily. A solution of soso-iodol-mercury with iodide of sodium has been recommended for intramuscular injection in syphilis.

Aristol (di-thymol-iodide) is a reddish-brown powder containing 45.8 per cent. of iodine. It is insoluble in water, glycerin, or alcohol, but soluble in ether or oils. It has been used successfully in various skin affections, psoriasis, eczema, rhinitis, ozena, and lupus, but has proved unsatisfactory in lichen rubra, soft chancre, and gonorrhea. Aristol has a certain effect on venereal ulcers, but acts very slowly; the only advantage it possesses over iodoform is absence of smell—its activity is inferior. It has been found of service in the first and second stages of pulmonary tuberculosis when no cavities exist. It also lessens cough and night sweats. Burns and scalds have been successfully treated with aristol, and the application in a powder to the cornea in keratitis and in an ointment in corneal ulcers has given good results. It is of great value in nasal affections; it lessens the discharge, relieves pain, and stops bleeding when used as an insufflation in cancer of cervix uteri.

Europhen (iso-butyl-ortho-cresyl-iodide) occurs as a pale orange, non-crystalline powder, containing twenty-eight per cent. of iodine. It possesses powerful antiseptic properties, and being resinous to the touch it adheres well to mucous membrane and wound surface, and does not easily cake. A given weight as compared with iodoform will cover a surface five times the area of the latter. It is non-poisonous, and acts only when brought into contact with secreting surfaces, which decompose it and liberate iodine. Its lightness and freedom from odor make it especially useful in dentistry. The general opinion of europhen is that it may be used with advantage in all cases where iodoform has been used. Improvement has followed its use by inunction

and subcutaneous injection in tubercular leprosy, and it has been found serviceable in eye disease, otitis, and ozena. Europhen has failed in eczema, psoriasis, and gonorrhea, but has given satisfactory results in simple and venereal ulcers, and in oily solution injected daily for syphilis.

Loretin (meta-iodo-ortho-oxy-chinolin-ana-sulphonic acid) is a bright yellow crystalline powder, odorless, and similar in appearance in iodoform. It is very slightly soluble in water or alcohol, and insoluble in ether, but forms soluble salts with alkalis, except with lime. It is non-poisonous and unirritating, and has been used with marked curative effect on burns, ulcers, and other wounds.

Airol, a gallate of bismuth and iodine, is a light grayish-green powder, stable in dry air, but when left in contact with moisture iodine is gradually liberated. It is insoluble in water, alcohol, and ether. Airol is astringent and desiccative, as well as being antiseptic.

Di-iodoform (ethylene periodide) occurs in yellow crystals, almost inodorous, insoluble in water, soluble in chloroform, and slightly in alcohol and ether. It is partly decomposed by light. It has been recommended as an antiseptic in place of iodoform.

Antiseptol (iodosulphate of cinchonine) is an odorous brown powder, which has been recommended as a substitute for iodoform. It contains half its weight of iodine, and is soluble in alcohol or chloroform, but is insoluble in water.

The chief non-iodine compounds which have been introduced to compete with iodoform as an antiseptic are dermatol, thioform, and thioresorcin.

Dermatol as a basic gallate of bismuth is recommended as a powerful non-irritant antiseptic and desiccant. Applied to wounds it induces rapid cicatrization, does not irritate nor give rise to toxic effects. It is not well suited to septic wounds, and insufficiently stimulating in chronic indolent ulcers. It is a quicker microbicide

than iodoform. Its use in the treatment of venereal ulcers has been successful, and also in pustular and diphtherial conjunctivitis, corneal ulcers and pannus, but of little use in blepharitis. Dermacol is a yellow powder, odorless, and insoluble in water.

Thioform, a basic bismuth salt of di-thio-salicylic acid, is a yellowish-brown powder, odorless, and insoluble in water. Its claim to supplant iodoform is based upon its freedom both from odor and from toxic properties, its greater antiseptic strength, and its desiccative action. It freely absorbs secretions from wounds without forming a crust. As a desiccant antiseptic, especially for eye cases, it has been recommended.

Thioresorem is a combination of sulphur with resorcin. It is a yellowish-white, inodorous and non-toxic powder, insoluble in water, slightly so in alcohol and ether. As a dusting powder it has been used instead of iodoform, and a ten- to twenty-per cent. ointment for eczema, psoriasis, and other skin diseases.—*British Medical Journal*.

LIBERAL DIET IN TYPHOID FEVER.

The editor of the *Therapeutic Gazette* seems to think that one of the gravest dangers that threatens the continued success of the busy practitioner is the tendency to relapse into routine treatment, namely, that of prescribing the same medicines for the same diseases in patients where different manifestations exist, or that of rigidly adhering to fixed rules of diet where a little thought would enable him to vary the diet and so improve the nutrition of his patient.

"In no disease is the importance of liberal feeding greater than in typhoid fever, for in this malady the patient, through a number of weeks, has his strength continually sapped by fever, diarrhoea, and the various complications of this malady, with the result that at the end of even a mild attack he finds him-

self in convalescence miserably weak and lacking both nervous and muscular energy. It is a noteworthy fact, familiar even to the laity, that this lack of power of mind and body often lasts for many months after apparent recovery has taken place. The question naturally arises whether this atony and asthenia are an unavoidable consequence of the disease, and if so, whether it is possible to modify them to such an extent that convalescence may be more rapid and that recovery from the attack itself may be the sooner arrived at. It has been the custom of a great number of the profession for many years to order an absolute milk diet for patients suffering from typhoid fever, and to continue them on this diet for a number of days or even a week after the fever has disappeared and the temperature of the patient has been normal. Further than this, this diet is frequently insisted on when complications of typhoid fever arise which still further aid in decreasing the patient's vitality, and often a milk diet is insisted upon when it seriously disagrees with the patient, who because of idiosyncrasy, or because of some complication of his disease, is unable to digest milk properly. We have reached these conclusions not only from general and personal experience, in which we have recently had ample opportunity to become convinced of this matter, but by reason of an article published by Dr. Frederick C. Shattuck of Boston upon this topic. After some general considerations he tells us that from 1886 to 1893, 233 cases of typhoid fever were treated in the Massachusetts General Hospital under a milk diet, with a mortality of ten per cent.; from 1892 to 1897, 147 cases have been treated under a much more extended diet, with a mortality of 8.1 per cent. He recognizes fully the liability to error in reckoning from too small figures in any infectious disease, and while he does not urge that this slight decrease in mortality may have been due to the more liberal diet allowed, it certainly points to the fact,

as he thinks, that the more liberal allowance of food has no deleterious influence.

"Dr. Shattuck believes that we should treat the patient rather than the disease, and feeding him with reference to his digestive power rather than solely with reference to his fever, particularly as there are many other articles of diet than milk which can by no possibility exercise a harmful influence upon the intestinal ulceration. The diet-list which he allows and which would certainly be considered very liberal in the average hospital and in many cases of private practice is as follows:—

"1. Milk, hot or cold, with or without salt, diluted with lime-water, soda-water, Apollinaris, Vichy; peptonized milk; cream and water (i.e., less albumen); milk with white of egg, buttermilk, kumiss, matzoon, milk whey, milk with tea, coffee, cocoa.

"2. Soups: beef, veal, chicken, tomato, potato, oyster, mutton, pea, bean, squash; carefully strained and thickened with rice (powdered), arrowroot, flour, milk or cream, egg, barley.

"3. Horlick's food, Mellin's food, malted milk, somatose.

"4. Beef-juice.

"5. Gruels: strained corn-meal, crackers, flour, barley-water, toast-water, albumen water with lemon-juice.

"6. Ice cream.

"7. Eggs, soft boiled or raw; egg-nog.

"8. Finely minced lean meat, scraped beef; the soft part of raw oysters; soft crackers with milk or broth; soft puddings without raisins; soft toast without crust; blanc-mange, wine-jelly, apple-sauce and macaroni.

"There are several articles in this list which we believe few, if any, typhoid-fever patients ought to receive, and these are the soups, the beef-juice, and the finely minced lean beef. In our experience all of these preparations tend to produce or to aggravate pre-existing diarrhoea; and beef-broth, as is well known, provides a very favorable culture-medium for the typhoid bacillus. We have

frequently seen the use of animal broths substituted for milk, and active, ill-smelling diarrhoea with great flatulence has followed. To the list just given we may add soft cup-custards, and instead of limiting the patient to milk with white of egg we have recently seen most valuable results follow the administration of egg boiled just long enough to take away its raw taste and yet not to harden the white. From one to six eggs prepared in this manner and administered to the patient by means of a spoon or in a cup, if he is strong enough to drink the egg, will do much toward maintaining strength, particularly in those cases where milk disagrees."—*Dietet. and Hygen. Gazette.*

BERIBERI. PATHOLOGY.

Three kinds of bacilli were found in tissues carefully secured from cases of beriberi in Senegal. One is a large bacillus six to ten microns in length and three-tenths to four-tenths micron in width, which is found especially in the kidneys; second, a medium-sized bacillus, three to four microns long and three-tenths micron wide, seen especially in certain vessels, as those of the kidney; the third is a very small bacillus, occurring in enormous numbers in the blood. The first two are probably of the same nature; as to the third, it is probably derived from the others.—*La Sem. Med.*

ON ARTIFICIAL FOOD PREPARATIONS.

The author, (Prof. Klemper, in *Berl. Klin. Woch.*, 1897, No. 26), gives a useful review of the artificial food-stuffs, considering them in regard to their actual value as nourishment. The partially predigested proteid-preparations, formerly called peptones, are now recognized as albumoses, since they contain but little peptone and much albumose. They are of course given to spare the stomach the necessity for digestion. This is, however, unnecessary, as even in extremely weak conditions the stomach is able to perform its peptonizing work, and

if it is unable the intestine will accomplish it—if native albumens be ingested in soluble or well-divided form. Nutrose and enkasin are good preparations of soluble albumen, and are well borne, but ordinary dried meat and egg-albumen well pulverized are quite as valuable. All these food-stuffs are merely illusions if they be taken by the teaspoonful, as more than three teaspoonfuls are rarely taken in the day. We need 30 to 40 grams of albumen daily, and in the syrupy "peptone" preparations we get but three to four grams to the teaspoonful of dry preparations of albumens. Somatose contains 9 grams to the same measure, equaling 33 calories. Contrasted to this one egg or 100 c. c. of milk furnishes 70 calories, and how much cheaper the latter are! Nutrose and eukasin provide more energy than somatose or peptones, but it is rarely necessary to order the artificial preparations. They contain no nucleins, however, which produce uric acid, and for this reason they are useful in gouty conditions, and with somatose and casein are free from irritating extractives, and therefore all these may be given in nephritis. Of the meat extracts all that can be said is that they increase the appetite, and provide a minimum of nourishment. Valentine's contains about $1\frac{1}{2}$ grams of albumen to the teaspoonful. Puro is much more useful, as it contains 33 per cent. proteids. It is nevertheless, in the quantities usually given, of little use as nourishment. Of the carbohydrate-preparations, such as Knorr's or Hartenstein's, more may be said in praise. But it must be remembered that soups made of these contain in general about one-fourth the nourishment in the same amount of milk. They are of value when milk is not well borne. Of the use of predigested starches, the author says we must remember that salivary digestion is scarcely ever lost, and that even should it be, we have the pancreatic juice and bacterial action in the intestines, and so the necessity for predigested starches rarely

arises, and their very high price almost excludes them from use. Malt extract is very useful, since it contains so much sugar and dextrin. A tablespoonful equals an egg in nourishment contained. Some natural carbohydrates are much cheaper, however, and quite as valuable. Honey he mentions as most useful, and especially valuable with diabetes, owing to its high percentage of levulose. Of fats we have in nature, butter, cream, egg-yolk, caviar, and oils. Such preparations as lipanin are unnecessary, as there exists scarcely a disease in which the fat-digesting power falls below the percentage which these preparations exhibit in predigested fats.—*Berl. Klin. Woch.*

SOME FACTORS IN THE ETIOLOGY OF HEPATIC CIRRHOSIS.

The etiology of cirrhosis of the liver is still in a condition of sufficient uncertainty to render an occasional review of the literature of this subject worth while. It is the object of this review to note the trend of thought in the available literature bearing on (1) the relation of alcohol to cirrhosis, and (2) relation of infections to cirrhosis.

The Relation of Alcohol to Cirrhosis.—In his thesis of 1897, Saingery, writing on the etiology of alcoholic cirrhosis, recognizes three kinds of alcoholic beverages which may be related to the disease. These are wine, alcoholic liquors (whiskey, gin, etc.), and essential liquors, as cordials, liqueurs and the like. He attempts in his work to settle the question as to whether all three forms are capable of producing cirrhotic changes, and produces the following figures to form a basis for his conclusions. Clinical observations give the following facts: In three hundred and twenty-eight individuals using only alcoholic and essential liquors to excess, without the least excess of wine, there was no cirrhosis. In sixty-eight individuals who abused wine, but not other forms of drink, cirrhosis was always pre-

sent in some degree. An inquiry into the history of one hundred and forty-four cirrhotic drinkers elicited the fact that all had abused wine, and sixty-eight of them nothing but wine. From this the author concludes that the drinkers of alcoholic and essential liquors do not become cirrhotic, and that therefore the cirrhosis of wine drinkers is not due to the alcohol itself. Pathologic observations showed that in thirty-nine autopsies on individuals who had used alcohol or essential liquors to excess, fatty liver was present. Those individuals who showed both cirrhosis and fatty liver at autopsy were all wine drinkers, but besides drank alcohol and essential liquors. The author concludes that wine produces cirrhosis and alcohol steatosis. The minimum dosage said to be necessary to produce cirrhosis from wine was from two to three liters daily, over a period of from eight to ten years. This much is necessary, but does not always produce cirrhosis. The author states that some brands of wine are more apt to produce cirrhosis than others, and asks as a final question what substance it is in the wine that causes the cirrhotic changes. The discussion before the French Academy of Medicine, in which Dr. Lancereaux is taking a prominent part, practically takes up the subject where Saingery leaves it. Lancereaux goes over the same ground as Saingery, and comes to the same conclusions, but goes a step further, and states that the cirrhosis of wine drinkers is dependent on the process of plastering, by which certain chemical agents of a noxious character are added to the beverage. He claims that it is the salts of potash contained in this plastered wine which cause the cirrhotic changes, and further claims that he was able to artificially produce cirrhosis in animals by causing them to eat food mixed with these salts. In from six to eighteen months all of the animals so treated showed more or less cirrhosis of the liver. In the discussions following Lan-

cereaux's papers he was strongly opposed by many of his colleagues. Various objections were brought against his contention, the main ones being the fact that cirrhosis occurred in non-wine-drinking countries, and the fact that it was very difficult in wine-drinking countries to find individuals who confined their attentions to wine. The question raised by Saingery and Lancereaux would seem to be still sub judice, but it is certainly worth looking into carefully. In connection with the relation of alcohol to cirrhosis, it may be added that from an experimental standpoint the production of cirrhosis by the administration of pure alcohol has been singularly unsuccessful. Lafitte, Strassman and Afanassief were all unable after months of experimentation to produce cirrhotic changes. Von Kahliden found only parenchymatous changes, and those mostly in the form of fatty degeneration. Straus and Blocq claim to have been able in some instances to produce the lesion.

The Relation of Infectious Diseases to Cirrhosis.—The evidence in favor of an infectious cirrhosis is both of a clinical and experimental nature. Cirrhosis of this character can perhaps be best observed in children, providing that hereditary syphilis can be excluded, as in children the alcoholic factor can usually be definitely excluded. The peculiar form of cirrhosis occurring in the Brahmin caste in the East Indies would seem to be a good example of infectious cirrhosis, according to the description of Gibbons, Chose, and Mackenzie. This form is always associated with gastro-intestinal disturbances; it occurs in children usually under one year of age, and seldom after three years, in whom syphilis can be excluded. According to most of its observers, it is due to the gastro-intestinal disturbances, and presumably associated with the absorption of toxic substances from the gastro-intestinal tract. It usually occurs among the children of the rich, who are fed at this time of

life mostly on vegetables and sweets. Gibbons has seen fourteen children in one family die of the disease in succession. In connection with this class of cases the experiments of Krawkow are of great interest and importance. This author, by introducing into the alimentary canal of fowls different micro-organisms, was able in some instances to produce marked cirrhotic changes in the liver. The bacteria which seemed most frequently to produce these changes were the bacillus pyocyaneus and the staphylococcus pyogenes aureus. Other authors have succeeded in producing an experimental cirrhosis by infecting the organism in general, or else the portal system or the biliary passages, either with bacteria or with their toxins. Scagliosi produced cirrhosis in fowls by injecting cultures of anthrax, prodigiosus, and subtilis into the blood, and concludes from his observations that infection played a much more important role than alcohol in the production of the disease. Roger obtained thromboses, hyaline degeneration and cirrhosis in the liver by infecting animals with his bacillus septicus putridus. Flexner observed cirrhosis in some instances after the continued injection of the blood serum of one animal into another. Gilbert and Dominici were able to produce cirrhotic lesions by an experimental infection of the biliary passages with various micro-organisms. Charrin was able to produce a cirrhotic process in the rabbit by injecting the toxins of bacillus pyocyaneus into the portal vein.

In all these cases changes in the cells were noted, as well as in the interstitial tissue, and most of the authors were inclined to believe that the cellular changes were the primary ones. In human pathology, within the last few years, there have been numerous cases reported in which changes in the liver cells similar to those experimentally produced have been noticed, and presumably such changes can be followed by cirrhotic processes. Thus in typhoid fever Reed

found areas of necrosis throughout the liver substance, and in one case, where the individual had had the disease some years previously, was able to demonstrate new connective tissue formation. Le Count and others have seen similar changes in the liver in tuberculosis; Flexner has observed them in various septicemias, and Barker has recorded a case of malaria in which they were present.

The supposition that cases of cirrhosis may result from such lesions, while resting in some instances on good ground, requires further study, both clinically and pathologically, and a closer attention to the relation of cirrhosis to infectious processes in general will doubtless render the etiology much clearer.—*Albany Medical Annals.*

NUCLEIN: ITS ORIGIN, CHEMICAL
COMPOSITION, PHYSIOLOGICAL
ACTION AND THERAPY.

Origin.

Nuclein is that constitution of the cell by virtue of which it grows, develops and reproduces itself. It is the chemical basis of the nucleus. Nuclein is contained in the cellular envelop of the tubercle bacillus, and it is the nuclein that takes the stain. It has been obtained from the thymus and thyroid glands, spleen, testicle, white of egg, and from brewers' yeast. It is abundant in the polymorphonuclear leucocytes. The number of kinds of nuclein is limited only by the different varieties of cells.

Chemical Composition.

It consists of a complex proteid base, nucleinic acid, containing from 5 per cent. to 9 per cent. of phosphorus. The terms "Nuclein" and "Nucleinic acid" are often used interchangeably, as it is generally impossible to obtain nucleinic acid free from the albuminous base.

Physiological Action.

The predominant action of nuclein is stimulation of glandular activity with in-

crease in the number of polymorphonuclear leucocytes, therefore, concurrently an increase in the germicidal properties of blood-serum.

Nature of its Action.

It is not germicidal in the circulation to all organisms, because disease organisms are of many types.

Effect on the Pulse.

Increased frequency as a rule within three to five hours.

Effect on Temperature.

Rise of one degree or more within three to five hours.

Therapy.

Vaughan has reported seventy-six cases of tuberculosis in all stages and with no exclusions, in all of which the tubercle bacilli were found and treated with daily hypodermic injections of 1 per cent. solution of nucleic acid, and of these so treated 24 per cent. have recovered. King reports thirty more similar cases treated by daily hypodermic injections of 50 minims of the 5 per cent. solution, and of these 22 per cent. recovered.

The writer has given the 1 per cent. solution in teaspoonful doses every three or four hours with local applications in cases of follicular tonsillitis, with marked benefit to the patient.—*Univers. Med. Jour.*

A CASE OF FATAL INFANTILE ANEMIA WITH GREATLY ENLARGED SPLEEN.

Vickery reports the case of a child, aged 18 months. There was no venereal history. The father had severe malaria. The child had been fed partly on breast milk, partly on undiluted cow's milk. At eight months it began to grow pale and weak, and the abdomen became swollen and hard. There was persistent diarrhea. The child was feeble and seemed to suffer; the anterior fontanel was open; there was a slight rosary, and the epiphyses were somewhat enlarged. There were hard pea-sized glands in the neck, axillae and groins; the liver was

moderately increased in size; the spleen extended slightly beyond the umbilicus to the right and downward to within two fingers' breadth of the anterior superior spine of the left ilium. The blood examination showed 2,500,000 red cells, 22,000 white cells, 32 per cent. of hemoglobin. The number of white cells counted was one thousand; small lymphocytes, 48 per cent; large lymphocytes and transitional cells, 8.9 per cent.; polymorphonuclear neutrophils, 29.4 per cent; eosinophiles, 4.8 per cent.; myelocytes, 8.2 per cent.; normoblasts, 57; megaloblasts, 92; microblasts 48; cells with karyokinesis, 6. There was a fair number of poikilocytes, a few macrocytes. The author suggests that the condition is an intermediate one between leukemia and pernicious anemia.—*Med News.*

THE EFFECTS OF LEMON JUICE ON THE CONSTITUENTS OF URINE.

The author wishes to determine the real worth of citric acid, which when taken in the form of lemon juice has for a long time been a popular remedy for rheumatism; although Von Noorden and Haussmann, in their experiments, did not find that it brought about any radical change in the constituents of gouty products eliminated by the urine. He mentioned a man who during an attack of gout drank in one day the juice of 48 lemons and continued to take the juice of 2 or 3 a day for three years. It evidently did influence the course of the disease in this case. For his experiments he used the above-mentioned man and two others; one a patient who suffered from epilepsy (of use only when free from attacks), the other a patient with mild emphysema. The specific gravity, acidity, total nitrogen, uric acid, urea, xanthin products, and phosphoric acid were estimated in all the experiments. The nitrogen was estimated by Kjeldahl method, uric acid by Gorrland-Hopkins method, urea by Morner and Sjöquist, the xanthin products

by a modification of Salkowski's method, phosphoric acid and salts by Freund's method, the acidity by one-tenth normal soda solution and phenolphthalein as indicator. The diet and amount of liquid were the same in each experiment and were previously analyzed.

He did not attempt to follow the citric acid through the system, but refers to the findings of others. His conclusions were as follows:—

1. That the elimination of nitrogenous elements of urine does not appear to be affected very much by large or small doses of lemon juice.

2. That the elimination of nitrogen as urea seems to be increased even if the total nitrogen is not.

3. The elimination of uric acid was not appreciably increased. In his own experiments it was about one-third less.

4. The elimination of xanthin products diminished, but more investigation is needed upon this point.

5. The elimination of phosphoric acid was increased in all his experiments. About one-quarter was in the mono-sodic phosphates, while the di-sodic phosphates were diminished.

6. Urination did not seem to be perceptibly changed.

7. The action seemed to be freer just after the administration and was increased by the size of the dose.

A DIAGNOSIS OF TRICHINOSIS.

Dr. Cabot reports the fact that in making a differential count of white corpuscles in a case, of the diagnosis of which he had no knowledge, he found 27 per cent of eosinophiles. In the light of a communication made to him by Dr. Thayer, the effect that he had discovered an extraordinarily large percentage of eosinophiles in two cases of trichinosis, Dr. Cabot was led to suspect the existence of this condition in the case under consideration. He immediately made inquiry of the physician for whom the blood-examination was made, and discovered that he had suspected the same condition, his opinion being based on the following history: The patient had been sent abroad for his health. While in Germany he improved very little. In the middle of the summer he developed a severe gastro-intestinal attack which was followed by considerable muscle soreness. When he returned in September his physician discovered a condition which he had first thought to be a neuritis. There was a great deal of soreness in the muscles of the calves of the legs and in the biceps. This gradually lessened, but was followed by an edema of the hands and face. The patient was so much improved at the time the blood examination was made that the idea of making an examination of the muscles to confirm the diagnosis was abandoned.—*Boston Med. and Surg. Jour.*

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Editorial.

TOTAL EXTIRPATION OF THE STOMACH.—The operation for the removal of the entire stomach has been successfully performed three times. The first case was by Schnelhardt, of Stettin, in 1895. In this case all of the stomach was removed, except a small portion of the cardiac end. This patient lived two and a half years in comfort and engaged in the active duties of life.

The second operation was performed by Schlatter, of Zurich, in the latter part of 1897. In this case the entire stomach was removed for cancer, and anastomosis was made between the esophagus and a loop of the jejunum, the divided end of the duodenum being closed by suture. This patient is still living, is in good health, takes food like any ordinary person, and has no impairment of digestion. To one who has studied carefully the nature of pancreatic digestion this latter fact is not at all surprising, and one can understand that even from the standpoint of the digestion of his food the patient would be better off without his cancerous stomach than with it. For the lack of hydrochloric acid in the stomach, found in carcinoma, and the foul discharges from the cancerous tumor, would precipitate decomposition in the food mass before it could reach the intestine and the pancreatic secretion for its digestion. In both the above cases anastomosis was accomplished by suture.

The last operation was performed by Brigham, of San Francisco, in St. Luke's Hospital, San Francisco, on the 24th of February of the present year. This case was in every point a singularly favorable one for operation. The patient was a remarkably healthy woman in other respects, and had not suffered from the disease long enough to become cachectic. Owing to defective teeth she had been for some time living on a semi-liquid diet, and under ordinary circumstances did not care for solid food, like bread and meat. So that the prolonged liquid diet used after the operation did not seriously incommode her. She had not, during her life, suffered from serious disease, was active in her habits,

and, as Dr. Brigham says in his report, was blessed with that best of all qualities to be found in a patient, "good common sense," which probably means "uncommon good sense."

The operation was done under "strict antiseptis." The abdominal fat was over an inch in thickness, necessitating an incision seven inches in length, or from the ensiform cartilage to a point an inch below the umbilicus. The omenta were tied off with catgut ligatures. The duodenum was divided, and as the stomach seemed almost entirely infected it was completely removed, the esophagus being divided just above the cardiac orifice. Upon trial it was found that the two divided portions of the alimentary canal could be brought together without too much tension, the attachments of the duodenum being free enough to allow of this being done. So the duodenum was united to the esophagus with a No. 3 Murphy button. The account of the after treatment is of great interest, showing remarkable facility on the part of the doctor in adapting his dietary and medication to the existing conditions. The Murphy button was not recovered; but wherever it was, and there seemed to be evidence to show that it was no longer at the site of the operation, it produced no untoward symptoms.

This operation will necessarily be of very limited application, as few patients who have suffered from carcinoma of the stomach for any length of time will be in condition to endure it. But in specially favorable cases it promises the hope of prolonged life and comfort to those heretofore considered to be doomed to weeks of the most intense suffering which is only relieved by death. From the physiological standpoint it is of great interest, and its results come as a matter of great surprise to many who had regarded the stomach as the organ of proteid digestion *par excellence*. But when we come to consider that even the digestion of proteids can be carried on in the intestine without any apparent decrease in efficiency, and that persons without stomachs can digest their food and live lives of activity in health and comfort, we begin to wonder if digestion is really the important function of the stomach! For this operation differs in character from the extirpation of one kidney, where the other by a process of physiological hypertrophy compensates for the lost function. But here we have a single organ, heretofore supposed to have a special function of the greatest importance, and which to all appearances could not be substituted by that of any other organ, entirely removed without seriously endangering the life of the subject. We may yet look for important modification in the views hitherto held on the question of the function of this organ.

In no department of medical science is there more active investigation at the present time than in the study of the *hamatozoa*. Since the discovery of the plasmodium malarie the greatest interest has been evinced by the medical profession in protozoan infections, especially those of the blood. Investigators are at work throughout the world on this important subject, and we shall not be greatly surprised to find that many yet of the serious affections that carry away thousands of the human race annually into untimely graves are due to infection with these low forms of animal life; and also that some of those obscure and intractable maladies that so often puzzle the physician in his diagnosis and therapeutics are due to the presence of non-toxic organisms, which, like the filaria sanguinis and trematode worms, produce disturbances in the system simply by their presence, thereby interfering with the function of organs, or using up the nutritive principles of the food.

The work of such observers as Danilewsky, Grassi and Feletti, Labbé, Laveran, Opie and MacCallum on the hematozoan infections of birds is adding much to our knowledge of the presence of these parasites in the blood, while the investigations of Laveran, the Italian physicians, Manson, and MacCallum on malarial infection are clearing up many obscurities in regard to the nature and manner of the infection, the method of reproduction of the parasite, and many other things hitherto not well understood. Since MacCallum read his paper before the British Association for the Advancement of Science (*Journal of Experimental Medicine*, Vol. III, No. 1), he and other observers have been pursuing the investigation into the life history of these organisms. So far as the malarial parasite is concerned the tendency of these investigations is to render it probable that the organism is parasitic in all the stages of its development; that the various forms found are modifications of the same parasite due to sex, development, and environment; that it develops by a true sexual process; and that certain insects, as the mosquito, are a desirable, though not absolutely necessary, intermediate host.

Other discoveries along the line of this sort of infections will doubtless be made, and there is no better field for this than China. We are waiting with some interest for further account of the organisms described by von Tuzleman in the March number of this JOURNAL of last year and in the Customs' Medical Reports for 1897, and by him considered to be the cause of an intractable remittent fever that resisted treatment by quinin, but yielded to the administration of methylene blue. Two

members of our Association have also found in the blood of two patients suffering from profound simple anemia a protozoan whose development they have had but slight opportunity to observe. Doubtless, if they shall be able to proceed with their investigations, they will publish the results in the near future.

It seems necessary to call the attention of *newly-elected members* of the Association to the necessity of sending a letter of acceptance to the Secretary, Robert C. Beebe, M.D., Nanking, and also of sending the fee (\$1) and annual dues (\$2) to the Presbyterian Mission Press, Shanghai. When this is done their names will be entered upon the roll, and they will receive the JOURNAL. Several of those elected since our list of members was published last year have failed to comply with these requirements, therefore they fail to receive the JOURNAL and their names are not entered on the roll of the Association. Will those sending names to the Secretary also kindly send their proper qualification, name of mission, and name of station.

The *election of officers* of the Association will take place at the close of this year. Voting papers will be sent out with the October number of the JOURNAL. The officers to be elected are: a President, a Vice-President, a Secretary, a Treasurer, an Editor, and a Curator of the Museum. Will members kindly send in nominations for these offices before September 15th, so that the names may be announced at the same time of sending out the voting papers!

Owing to the lack of time on the part of the editor and his inability to secure anyone else to do the work, the *review of hospital reports* must lay over until our next number. We acknowledge receipt of the following reports:—Report of the London Mission Hospital, Hankow, for 1896 and 1897; Report of Medical Mission Work in Hing-hua City; Report of A. B. C. F. M. Hospital for Women and Children, Foochow; Sixth Annual Report of the General Hospital of the Methodist Episcopal Church, Chungking; Report of the Hospital and Dispensary at Chefoo in connection with the China Inland Mission for the year 1897; Report of the Hangchow Medical Mission in connection with the C. M. S. for 1897; Twelfth Annual Report of the C. M. S. Ningpo Medical Mission; Report of the London Mission Hospital at Chungking for 1897.

We are glad to see that DR. H. W. BOONE, one of our esteemed senior medical missionaries, is again able to return from the home land, where he went for the recuperation of his health and a rest, and once more take up his work in St. Luke's Hospital, Shanghai. We bid him a hearty welcome.

The address of DR. JAS. B. NEAL, in America, is Bloomsburg, Pa. His many friends can reach him by letter at that place.

Miscellany.

At the annual meeting of the Society for the Suppression of the Opium Trade, held in the Memorial Hall, Farringdon Street, London, on Monday, February 28th, the following resolution was unanimously agreed to:—

“The following missionaries and other foreign residents who have, by addresses when in this country, by their writings, and in other ways rendered essential service to the Anti-Opium movement, are hereby appointed (subject to their consent), as corresponding members of the Executive Committee, with the right to attend and take part in its sittings when in England; and the Executive Committee is authorised from time to time to add other names to the list, subject to confirmation at the next annual meeting of the Society.

“*China.*—John Dudgeon, M.D., Peking; Tsao Yung-kwei, M.D., Methodist Episcopal Mission, Peking; Rev. Frederick Brown, Methodist Episcopal Mission, Tientsin; Rev. John Innocent, Methodist New Connexion Mission, Tientsin; Rev. W. Muirhead, D.D., London Mission, Shanghai; Rev. J. Hudson Taylor, M.R.C.S., China Inland Mission, Shanghai; Rev. Yung King-yen, American Episcopal Mission, Shanghai; Rev. Griffith John, D.D., London Mission, Hankow; Rev. Arnold Foster, B.A., London Mission, Hankow; S. R. Hodge, M.R.C.S., Wesleyan Mission, Wu-chang; Rev. Joseph S. Adams, American Baptist Mission, Han-yang; Rev. Hampden C. DuBose, D.D., Soochow, President of the Anti-Opium League of China; Ven. Arch. Wolfe, Church Missionary Society, Foochow; Rev. Robert Swallow, M.D., Methodist Free Church Mission, Ningpo; Rev. J. C. Gibson, M.A., English Presbyterian Mission, Swatow.”

We give only the names of those resident in China. India, Australia, Straits Settlements, Burma, Ceylon, Formosa, and Holland are also represented in the list.

A correspondent at Soochow sends us the following well-deserved appreciation:—

“One of the most heroic women of China is Mrs. B. C. Patterson, M.D., of the Southern Presbyterian Mission, Hsü-chien, North Kiang-su. Eighty miles from any other foreign lady, herself and baby exposed daily to the famine fever while her husband was away helping the starving thousands, she has in nine months had 8,000 patients, and expects to remain at her post during the heated term, ministering to the sick and suffering.”—*N.-C. Daily News*.

SHARP CONTRASTS.

In a city paper a few days ago on the same page we read two news items that presented strong contrasts. We were impressed with the declaration of the Great Teacher: "Fear ye not; ye are of more value than many sparrows," and wondered if it could be true.

The first item represented a case of starvation in a thickly populated part of a great city. The parties were miserably destitute, and their neighbors had helped them from time to time. As no life or stir had been seen for a day or two, an investigation was made. The aged husband was found lying dead in the doorway, having apparently fallen and died in an effort to get something to eat for his starving wife, who was found in bed, still alive, but unconscious. She was removed to a hospital, with but little hope of her recovery. This was in one of the largest and most plentifully supplied cities in the United States. It was men that the Teacher said were of "more value than many sparrows."

The other item spoke of a dog show—a bulldog show to be held in New York City, and of the hundreds of dollars paid by fashionable women for the comfort, adornments, and care of these repulsive creatures, to say nothing of the money invested in the dogs themselves. In this same city there are thousands of children, men and women pinched by hunger, benumbed by cold, and wailing piteously for the meanest of the favors shown to these dogs! The luxuries and follies lavished upon these miserable brutes would furnish food, fuel, and clothing for many a destitute one; medicine and medical help for the indigent sick, or a comfortable bed and care in some hospital! Who shall awake the mother heart and the mother instinct in these faddists and philo-canines?—*Iowa Health Bulletin.*

Medical work is being carried on in hospitals and dispensaries for men and women, and is so closely connected with the evangelistic work as to really form an organic part of it. In fact, it gives a force to evangelistic preaching that perhaps nothing else can give. A mission without a hospital is a weak mission. A well conducted hospital is not only an inestimable blessing to the sick who are treated in it, and during their visit learn of the Great Physician, but it strengthens the whole work of the mission by providing an object lesson in Christianity which all can understand and none can gainsay.

We would emphasize the need of high training for this work. No man should practice in China who has not the full qualifications required in the home lands. Men and women who have special qualifications in surgery, treatment of the eye, cutaneous diseases, etc., etc., will find almost limitless spheres of influence open to them. Leper asylums have been started in different parts of China and are doing noble work.

It may be well to remember that the native doctors are entirely without any knowledge of physiology or anatomy, that while they possess a few useful remedies for well-known diseases nine-tenths of their pharmacopeia is revolting in its uncleanness and ludicrous in its childishness. At the best they are only empirics, and that of a very low order. The sorrowing cry of myriads whose lives are stunted by disease with which Western medicine might easily cope rises up day by day. Would that it might enter into the soul of many Christian men and women now pursuing their course as medical students, and constrain them to turn their eyes from the dazzling prizes that successful practice may gain in Britain or America and devote themselves to the life—that perhaps of all others most lends itself to Christian acts of sympathy and helpfulness—of the medical missionary.”—*The Student Volunteer*.

Dr. Kerr writes, under date of June 15th, from Hoihow, Hainan :—

“DEAR DR. STUART: I am very sorry that I have nothing to send you for the Journal. I have been absent from Canton since the last of April, and after spending some three weeks in Macao I came to this place, feeling the need of rest, and although not sick, just enough out of sorts to have no energy. We are visiting my daughter, Mrs. Dr. McCandliss, and although the tropical heat is not invigorating they have a house on the seashore where the sea breezes are cool and refreshing.

“The plague has been very bad in Canton, and one of the teachers of the medical class and one of the most promising pupils have died. Others connected with the hospital have fallen victims. The class was suspended in May, and will not resume work until the violence of the epidemic is over. Only sporadic cases of plague have occurred here, but last year there was a violent epidemic, and Dr. McCandliss treated some 40 or 50 cases.”

Just before leaving for America, Dr. Neal sent us the list of eye terms to be found among the contributed articles in this number of the JOURNAL, and addressed us a letter, part of which we quote below :—

“DEAR DR. STUART: The appearance of Dr. Jellison's article on terminology in the last number of the Journal has stirred me up to think it may be desirable to print the article which I send you inclosed. It certainly does seem that it would be well to let people know some thing of what is being done, as otherwise everybody is working in the dark. Dr. Jellison has evidently done some good thinking on the subject, but it is impossible to suppose he would not be influenced in his conclusions by the opinions of others if he knew what they were.

“My only hesitation in sending this list to you for publication arises from the fact that it is one individual publishing the work of a committee

without consultation with the other members of the body. Now I shall have to leave it with you to decide whether this is admissible or not. I am just on the point of leaving for America, so I cannot write to the different members scattered all over China, but I wish you would feel at perfect liberty to do as you think best "

We have complied with the doctor's request, only desiring to say that there are certain terms in the list upon which the editor would reserve his decision until anatomical and physiological terms are decided upon. This may necessitate some minor changes in this list.

ONE WOMAN AND HER DOCTOR.

A wealthy San Francisco woman (*Weekly Medical Review*, *Monthly Retrospect*, April 15th) who had undergone an operation successfully performed by the physician she employed, was surprised when a bill of only \$50 was presented to her. She remonstrated, saying that the sum was not sufficient for the work done for one in her circumstances. But the doctor persisted that \$50 was his charge for that sort of operation, and her circumstances had nothing to do with it. She, however, sent him a check for \$500, and was surprised when she later received a receipted bill for \$450 for itemized services rendered to the poor humanity of the city. This pleased her so that she sent another check, which is being worked out in the same way.

The example is a good one and to the credit of both patient and doctor. Those patients whose financial ability renders them capable of recompensing their physician beyond the low rate which social conditions in many instances have established as the market value of his specific services would probably be more willing in this way to share in the doctor's unostentatious charities, while the physician who receives such supplementary fees does a service to his profession and to humanity at large by calling attention to the vast amount of charitable work done by the medical brotherhood.

CELTIC WIT.

An Irish brakeman in the railroad yards was hurt by the train, and his friends offered to send for a physician. They asked: "Do you want an allopath or homeopath?" He replied: "It don't matter—all paths lead to the grave."—*Exchange*.

Barber.—They say that cholera is in the hair.

Customer.—Heavens, I hope you are careful of your brushes.

Barber.—O, I don't mean the 'air of the 'ead, but the hair of the hatmosphere.—*Punch*.

BIRTHS.

At Tung-chow, near Peking, 9th Feb., the wife of J. H. INGRAM, M.D., of a daughter.

At Chen-tu, Sz-chuen, 16th Feb., the wife of O. L. KILBORN, M.D., of a daughter.

At Foochow, Fuhkien, 16th March, the wife of H. N. KINNEAR, M.D., of a son.

At Chang-teh-fu, Honan, 9th March, the wife of J. MENZIES, M.D., of a daughter.

At Moukden, Manchuria, 20th March, the wife of Rev. J. M. GRIEVE, M.A., M.B.C.M., of a son.

At Nanking, 21st May, the wife of Rev. GEO. A. STUART, M.D., of a son.

At Nanking, 10th June, the wife of W. E. MACKLIN, M.D., of a daughter.

DEATHS.

At Chemulpo, Corea, on the 16th April, E. B. LANDIS, M.D., of the English Church Mission.

ARRIVALS.

At Shanghai, 12th March, A. G. PARROTT, L.R.C.P. (London), M.R.C.S. (Eng.) (returned), and Mrs. PARROTT and two children.

At Shanghai, 4th June, H. W. BOONE, M.D. (returned.)

At Shanghai, 22nd June, Mrs. ELIZABETH WHITE, M.D., unconnected, from Australia.

DEPARTURES.

From Amoy, 18th March, P. B. COUSLAND, M.B., C.M., and wife, *via* U. S. A. for England, and Mrs. A. K. SCOTT, M.D., for U. S. A.

From Shanghai, 19th March, Miss L. J. WYCKOFF, M.D., for U. S. A.

From Shanghai, 26th March, F. A. WAPLES, M.D., and family, and Rev. C. H. FINCH, M.D., and family, for U. S. A.

From Shanghai, 11th April, S. L. BRANDER, M.B., and child, for England.

For Shanghai, 13th April, J. L. VAN SCHOICK, M.D., and family, for U. S. A.

From Shanghai, 23rd April, H. T. WHITNEY, M.D., and wife, for U. S. A.

From Shanghai, 9th May, G. S. WALTON, M.B., C.M., and wife, for England.

From Shanghai, 10th May, E. C. MACHLE, M.D., and wife, for U. S. A.

From Shanghai, 12th May, J. B. NEAL, M.D., and wife, for U. S. A.

Official Notice.

The following persons have been duly elected members of the Medical Missionary Association of China:—

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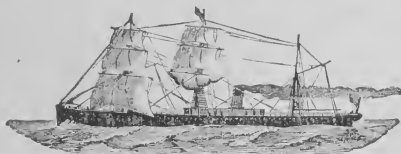
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The Subscription Price for *The China Medical Missionary Journal* is Three Dollars a year. There are to be four numbers in each volume.

We will be obliged to our friends for an early transmission of the subscription money, as we have no reserve funds with which to meet our printers bills. OFFICERS OF THE SOCIETY, WHOSE NAMES ARE GIVEN ABOVE, ARE HEREBY REQUESTED TO KINDLY ACT AS LOCAL AGENTS IN SOLICITING SUBSCRIPTIONS AND IN RECEIVING AND TRANSMITTING MONEYS, which now should be forwarded to the Rev. G. F. Fitch, Presbyterian Mission Press, Shanghai.

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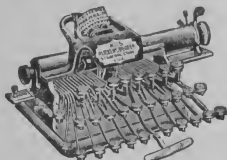
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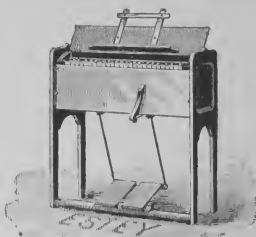
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